PHOENIX CONTACT
PSI MODEM SMS RELAY
Ord-No. 23 13 520
Input
Output
GSM Status
Prog
SIM
POWER
VPN
ALR
LAN
VCC
TD
RD
FO SIGNAL
ERR A
ERR B
VCC
FEF
LINK

Industrial communication technology

As modern systems and machines become increasingly automated, ever larger amounts of information need to be processed. The higher data volumes, coupled with the integration of complex field devices, is demanding more and more in terms of the performance capabilities of the communication networks used.

The "main arteries" of these networks consist of various types of serial data link, which are neither inter-compatible nor capable of satisfying the increasingly stringent requirements with regard to immunity to interference, range, and speed. Even in harsh industrial environments, our products ensure interference-free and high-performance data transmission.

Copper transmission

High-performance isolators, repeaters, and converters are available for all leading networks. The devices excel thanks to their high insulation voltages between the interfaces, which effectively prevent faults and compensating currents.

Fiber optic transmission

Fiber optic data transmission has become the norm, particularly in critical applications with very high requirements regarding availability. Whether immunity to interference, high performance, electrical isolation or network expansion, the use of fiber optic technology is unavoidable.

Remote communication

Global networking of machines and systems. Alarm generation, remote maintenance, and continual data acquisition. From classic analog modems to fast mobile phone routers: the right system for every application.

Wireless

Signals from measuring and monitoring stations often have to be transmitted over long distances. Modern wireless systems are a flexible, extendable, and low-cost alternative. Depending on the distance to be covered and the signals to be transmitted, various wireless technologies are available such as Trusted Wireless, Bluetooth or WLAN.

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Copper transmission

	Repeaters	Active bus termination	Isolators + converters	Patch panels	Segment couplers
System	DeviceNet, PROFIBUS, RS-485, ControlNet	RS-485, Modbus, PROFIBUS	TTY (CL), RS-232/RS-422/RS-485	Ethernet, PROFINET	FOUNDATION, PROFIBUS PA
Description	For electrical isolation and increasing the range	Termination resistor, for active bus termination	Interface isolators and converters, for electrical isolation	Passive mini patch panels, with various connection options	Device coupler, **See section: Process infrastructure**
Page	355	356	360	452	483

Fiber optic transmission

	FO converters	FO converters	FO converters	FO converters	FO converters
System	PROFIBUS	ControlNet, DeviceNet, CANopen	INTERBUS	Modbus, RS-485 2-wire, RS-485 4-wire	RS-422, RS-232
Description	For PROFIBUS, Termination devices and T-couplers	For ControlNet™, DeviceNet™, CANopen®, Termination devices and T-couplers	For INTERBUS, Termination devices and T-couplers	For RS-485 2-wire and RS-485 4-wire systems, Termination devices and T-couplers	For RS-422 and RS-232 up to 115.2 kbps Termination devices and T-couplers
Page	365	369	372	371	373

Ethernet networks

	Media converters	COMSERVER	Isolator	Switches	Secure networks
System	EtherNet/IP, Modbus, PROFINET, Ethernet	Ethernet, RS-232, RS-422, RS-485	EtherNet/IP, Modbus, PROFINET, Ethernet		
Description	Conversion of 10/100Base-T(X) Ethernet to fiber optics WDM technology	Device servers for converting serial interfaces	4 kV Ethernet ISOLATOR for electrical isolation	Switches, INTERFACE modules, hubs, Power over Ethernet module **See section: Ethernet networks**	Router with firewall for control cabinet, for mobile use, PCI **See section: Ethernet networks**
Page	451	460	414	6	40

Remote communication

	Mobile phone network		Public network		Private network
System	GSM I/O	GSM UMTS/3G Ethernet	ADSL Annex A, B Ethernet/RS-232	V.34 (analog) Ethernet/RS-232	Ethernet PROFIBUS RS-232/RS-422/RS-485
Description	**GSM/SMS relays,** 6 analog/digital inputs, 4 digital outputs	**Industrial mobile phone router,** for GPRS/EDGE and UMTS/HSPA	**DSL broadband router/modem,** with firewall, VPN and serial device server	**Analog modem,** for dial-up line/permanent line operation	**Extender (SHDSL)** for in-house cables
Page	421	423	427	428	431

Fieldbus components and systems

	Controller boards	
System	INTERBUS	INTERBUS
Description	**PC master/slave controller boards**	**Master controller boards** for SIMATIC S7-300/400
Page	434	436

Wireless data communication

	Radioline	Bluetooth/WirelessHART	RAD-Line (900 MHz)
System	TRUSTED WIRELESS RS-232 RS-422 RS-485	Bluetooth WirelessHART	Trusted Wireless Ethernet
Description	Radioline wireless modules 2.4 GHz and 900 MHz with I/O extension modules	Wireless-MUX WirelessHART gateway/adapter Bluetooth interface converter	Unidirectional and bidirectional wireless systems
Page	From page 448		

Fast connection technology

	SUBCON	
System	PROFIBUS CANopen	RS-232 RS-422 RS-485 INTERBUS
Description	D-SUB fast connection for PROFIBUS, CANopen®, and SafetyBUSp	D-SUB fast connection for Modbus, INTERBUS, RS-232, RS-422, RS-485
Page	440	444

Accessories

	Cables, plugs, and tools		
System	PROFIBUS	Ethernet	FO
Description	PROFIBUS cable, type A Fast Connect and quick stripping tool	CAT5e cable SF/UTP, RJ45 plug, crimping pliers, patch cable	Fiber optic cables, plugs, and tools
Page	439	417	378

Repeater for PROFIBUS DP and RS-485 2-wire systems

The performance and availability of bus systems can be significantly increased by using repeaters. Segmenting the bus with repeaters makes it possible to increase the permissible extent of the network many times over and to extend the number of devices. Bus cable short circuits only affect the relevant segment.

The **PSI-REP-PROFIBUS/12MB** modular repeater has been specially developed for the requirements of PROFIBUS systems. As stipulated by the PROFIBUS installation guidelines, the PROFIBUS network is connected using D-SUB connectors.

– Automatic data rate detection or fixed data rate setting via DIP switches
– Suitable for all data rates of up to 12 Mbps
– High-quality 4-way electrical isolation between all interfaces (PROFIBUS (A) // PROFIBUS (B) // power supply // DIN rail connector)
– Bit oversampling for reliable detection of sporadic disturbances
– Bit retiming for unrestricted cascading of devices
– Filtering of faulty telegrams based on start delimiter detection
– Routing of supply voltage and data signals through DIN rail connectors
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

As a modular repeater, the **PSI-REP-RS485W2** can be used in RS-485 2-wire bus systems. The device supports bus systems that rely on the UART/NRZ data format with a character length of 10 or 11 bits.

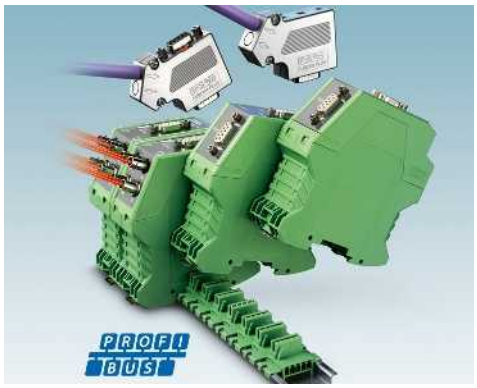
– Suitable for data rates of up to 500 kbps (adjustable via DIP switches)
– High-quality 4-way isolation between all interfaces (RS-485 (A) // RS-485 (B) // power supply // DIN rail connector)
– Bit oversampling for reliable detection of sporadic disturbances
– Bit retiming for unrestricted cascading of devices
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

The **PSM-ME-RS485/RS485-P** compact repeater is designed for universal use in RS-485 2-wire bus systems.

– Transmission speeds of up to 1.5 Mbps
– Space-saving narrow 22.5 mm device
– High-quality 3-way isolation (RS-485 (A) // RS-485 (B) // power supply)
– Shipbuilding approval according to DNV

Notes:

1) EMC: Class A product, see page 553

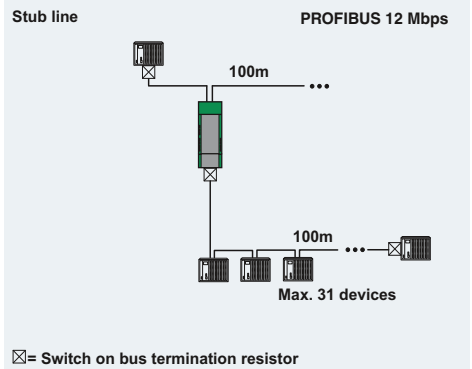


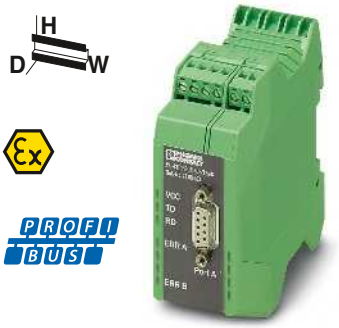
Supply	
Supply voltage	
Nominal current consumption	
RS-485 interface	
Data format/coding	
Data direction switching	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
General data	
Bit distortion, input	
Bit distortion, output	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Electrical isolation	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Repeater, for electrical isolation and increased range
for PROFIBUS up to 12 Mbps, 4-way isolation, modular expansion possible
for RS-485-2-wire bus systems, 4-way isolation, modular expansion possible
for RS-485-2-wire bus systems, 3-way isolation

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device

System power supply unit, primary-switched





Repeater for PROFIBUS

Ex: // Applied for: cUL / UL

Technical data

Supply	24 V DC ±20%
	90 mA (24 V DC)
Interface	PROFIBUS acc. to IEC 61158, RS-485 2-conductor
Protocol	UART (11 bit, NRZ)
	Automatic control, min. station response time 2 bits
Connection	(external)
	Manual and automatic adjustment: 9.6/19.2/45.45/93.75/187.5/500 kbps ; 1.5/3/6/12 Mbps
	max. 1200 m (depends on transmission speed and cable type)
	D-SUB-9 socket
Mechanical tests	Max. ± 35%
	< 6.25%
	< 1 bit
	60 V DC / 42 V AC, 1 A
	1.5 kV
Ambient conditions	-20 °C ... 60 °C
	(VCC // TBUS // PROFIBUS (A) // PROFIBUS (B))
Dimensions	35 mm / 99 mm / 105 mm
Approvals	Ex II 3 G Ex nAC IIC T4 X
	508 recognized

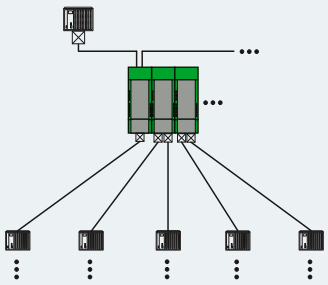
Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-REP-PROFIBUS/12MB[1])	2708863	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

Star structure



☒= Switch on bus termination resistor

Repeater for RS-485 2-wire systems

Ex: // Applied for: cUL / UL

Technical data

Supply	24 V DC ±20%
	75 mA (24 V DC)
Interface	RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire
Protocol	UART (11/10 bit switchable ; NRZ)
	Automatic control, min. station response time 2 bits
Connection	390 Ω / 180 Ω / 390 Ω (can be connected)
	Can be set manually: 4,8/9,6/19,2/38,4/57,6/75/93,75/115,2/136/187,5/375/500 Kbps
	max. 1200 m (depends on transmission speed, bus system and cable type)
	Plug-in screw connection
Mechanical tests	Max. ± 35%
	< 6.25%
	< 1 bit
	-
	1.5 kV
Ambient conditions	-20 °C ... 60 °C
	(VCC // TBUS // RS-485 (A) // RS-485 (B))
Dimensions	35 mm / 99 mm / 105 mm
Approvals	Ex II 3 G Ex nA II T4 X
	508 recognized

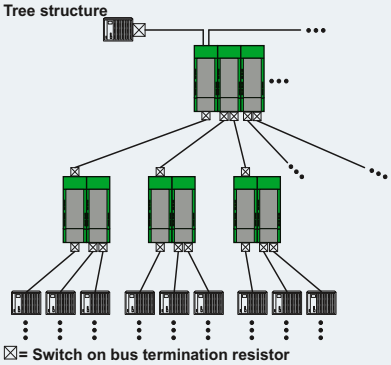
Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-REP-RS485W2[1])	2313096	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

Tree structure



☒= Switch on bus termination resistor

Basic repeater for RS-485 2-wire systems

Ex: // Applied for: cUL / UL

Technical data

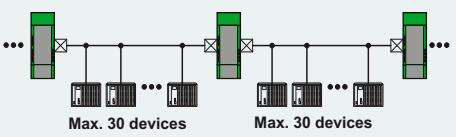
Supply	24 V AC/DC ±20%
	90 mA (24 V DC)
Interface	RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire
Protocol	UART (11/10 bit switchable ; NRZ)
	Automatic control, min. station response time 1 bits
Connection	390 Ω / 220 Ω / 390 Ω (can be connected)
	4.8/ 9.6/ 19.2/ 38.4/ 57.6/ 75/ 93.75/ 115.2/ 136/ 187.5/ 375/ 500/ 1500 kbps
	max. 1200 m (depends on transmission speed, bus system and cable type)
	Plug-in screw connection
Mechanical tests	Max. ± 35%
	< 3.6%
	< 200 ns
	-
	2 kV
Ambient conditions	0 °C ... 55 °C
	(VCC // RS-485 (A) // RS-485 (B))
Dimensions	22.5 mm / 99 mm / 114.5 mm
Approvals	-
	508 recognized
	Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSM-ME-RS485/RS485-P[1])	2744429	1

Accessories

Linear structure



☒= Switch on bus termination resistor

Active bus termination for PROFIBUS DP and RS-485 networks

PROFIBUS and RS-485 networks can be actively terminated using the PSI-TERMINATOR-PB.

This device relies on permanent termination to ensure interference-free communication, particularly in applications that involve alternating bus devices. The bus cable can be connected using either a plug-in double spring terminal block or a D-SUB socket.

Active programming and diagnostic devices are supplied with power via the D-SUB connection. This also makes the device ideal for use as a defined service and measuring connection within a bus system.

Properties:

- Interference-free bus communication thanks to active termination
- Fixed programming interface on the network
- Electrical isolation of supply and data interface
- Redundant power supply
- Diagnostic LEDs for voltage and data activity
- Extended temperature range of -20° … +65°C
- Termination can be activated externally
- Compact housing type
- DIN rail mounting

Application:

Motor Control Center (MCC)

- Replacement of MCC racks

Automatic vehicles

- Mobile industrial trucks that are regularly coupled to and uncoupled from machining stations

Changeover tools

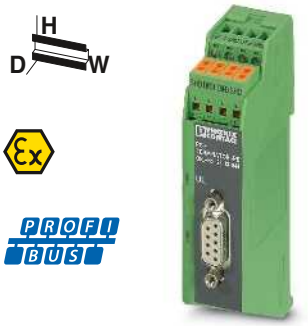
- Robot tools with bus interface

Service, programming, and diagnostics

- Fixed programming interface in the bus system

Notes:

1) EMC: Class A product, see page 553



Active bus termination

Ex: // Applied for: cUL / UL

Technical data

Supply		
Supply voltage		24 V DC ± 20% (via plug-in COMBICON screw terminal block)
Nominal current consumption		45 mA (24 V DC)
RS-485 interface		PROFIBUS acc. to IEC 61158, RS-485 2-conductor
Termination resistor		390 Ω / 220 Ω / 390 Ω (can be connected)
Transmission speed		≤ 12 Mbps
Transmission length		≤ 1200 m (depends on transmission speed and cable type)
Nominal output voltage		5 V DC
Strain relief		Shield connection clamp in spring-cage terminal block
Connection method		D-SUB 9, COMBICON
General data		
Test voltage		1.5 kV
Ambient temperature range		-20 °C ... 65 °C
Electrical isolation		DIN EN 50178 (RS-485 // VCC)
Dimensions	W / H / D	22.5 mm / 99 mm / 56 mm
Conformance / approvals		
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA / Canada		508 listed

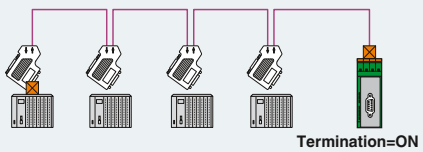
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Active termination resistor, for PROFIBUS and RS-485 bus systems, compact design, electrical isolation, bus termination that can be activated, programming interface	PSI-TERMINATOR-PB[1])	2313944	1

Accessories

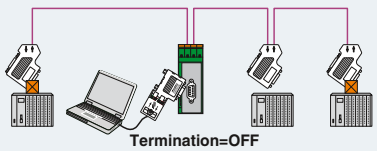
Description	Type	Order No.	Pcs. / Pkt.
PROFIBUS connector, up to 12 Mbps, integrated termination resistor which can be switched on externally, 9-pos. D-SUB pin, pin assignment 3, 5, 6, 8			
- Angled 90°, IDC connection	SUBCON-PLUS-PROFIB/90/IDC	2313672	1
- Angled 90°, screw connection	SUBCON-PLUS-PROFIB/90/SC	2313698	1
PROFIBUS cable, Fast Connect type, up to 12 Mbps, for permanent connection (02YSY (ST)CY 1X2X22 AWG) (Length in meters as per customer specifications)	PSM-CABLE-PROFIB/FC	2744652	1

Termination operation



☒ = Active bus termination resistor

Programming access



☒ = Active bus termination resistor

Repeater for ControlNet™

The **PSI-REP-CNET** modular repeater has been specially developed for the requirements of ControlNet™ systems. The ControlNet™ connection is established using standard BNC connectors.

The performance and availability of bus systems can be significantly increased by using repeaters. Segmenting the bus with repeaters makes it possible to increase the permissible extent of the network many times over and to extend the number of devices. Another advantage is that bus cable short circuits are restricted to the relevant segment.

- High-quality electrical isolation between all interfaces (ControlNet™ (A) // ControlNet™ (B) // power supply // DIN rail connector)
- Bit retiming for unrestricted cascading of devices
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- All connections can be plugged in using BNC connectors or a COMBICON screw terminal block
- Can be combined with the PSI-MOS FO converters in a modular way using DIN rail connectors
- Approved for use in zone 2

Notes:

1) EMC: Class A product, see page 553

Repeater for ControlNet™

Ex:

Technical data

Supply		
Supply voltage		24 V DC
Nominal current consumption		38 mA (24 V DC)
ControlNet™ interface		ControlNet™ interface, according to EN 50170
Transmission speed		5 Mbps
Transmission length		≤ 1000 m
Connection method		BNC 75 Ω
General data		
Bit distortion, input		± 35%
Bit distortion, output		< 6.25%
Bit delay		< 3 bit
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Ambient temperature range		-20 °C ... 60 °C
Electrical isolation		(VCC // CNET // CNET)
Dimensions	W / H / D	35 mm / 108 mm / 117 mm
Conformance / approvals		
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA / Canada		508 listed

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Repeater for electrical isolation and increasing the range	**PSI-REP-CNET[1])**	**2313737**	1

Accessories

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device	**ME 17,5 TBUS 1,5/ 5-ST-3,81 GN**	**2709561**	10
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1

Repeaters, segment couplers, and bridge for DeviceNet™ and CANopen®

The infrastructure components for CAN-based transmission systems (DeviceNet™ and CANopen®) can be used to implement interference-free and high-performance networks. Important requirements such as segmentation, electrical isolation, and expansion of the network coverage can now be implemented as easily as almost any network structures. The use of active infrastructure components increases network availability significantly.

Depending on the transmission speed, the signal runtimes in cables and devices limit the maximum achievable network coverage, as the CSMA/CA method typical of CAN only works in a limited time slot. Repeaters and segment couplers can be configured to eliminate these restrictions.

The **PSI-REP-DNET CAN** modular repeater provides an electrically isolated connection between two segments with the same data rate.

– Automatic data rate detection or fixed data rate setting via DIP switches
– Data rates of up to 1 Mbps
– High-quality 4-way isolation between all interfaces (CAN (A) // CAN (B) // power supply // DIN rail connector)
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

The **PSI-SC-DNET CAN** modular segment coupler connects two segments with different data rates. The segment coupler is configured using the PSI-CONF software that is supplied as standard so that only data telegrams with specific addresses (identifiers) are transmitted to the other segment. A segment coupler can be used to connect remote network segments using a slower CAN data rate.

– Data rates of up to 1 Mbps
– High-quality 4-way isolation between all interfaces (CAN (A) // CAN (B) // power supply // DIN rail connector)
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

The **PSI-BRIDGE-DNET CAN** modular bridge connects two segments of a network via different infrastructure solutions. The segments can operate at the same or different data rates. Modem/DSL paths, wireless connections or Ethernet networks can be used as alternative transmission technologies via the FL COMSERVER. An RS-422 interface is integrated as standard for connecting the desired infrastructure. The bridge is configured using the PSI-CONF software that is supplied as standard so that only data telegrams with specific addresses (identifiers) are transmitted via the RS-422. The advantage of the bridge is that it can be used to combine CAN-based networks with alternative infrastructure solutions.

– CAN data rates of up to 1 Mbps
– RS-422 data rates of up to 500 kbps
– High-quality 4-way isolation (CAN // RS-422 // power supply // DIN rail connector)
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

Notes:

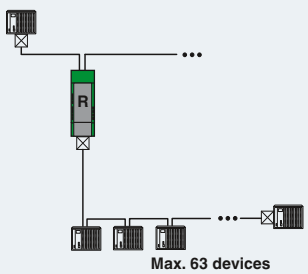
1) EMC: Class A product, see page 553

Supply	
Supply voltage	
Nominal current consumption	
RS-422 interface	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
CAN interface	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
General data	
Bit distortion, input	
Bit distortion, output	
Bit delay	
Test voltage	
Ambient temperature range	
Electrical isolation	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Modular repeater for electrical isolation and increasing the range
Modular segment coupler for connecting slow network segments
Modular bridge that allows the use of alternative transmission technologies

System power supply unit, primary-switched

Stub line



☒= Switch on bus termination resistor

Repeater
for DeviceNet™ and CANopen®

Ex:

Technical data

24 V DC	
55 mA (24 V DC)	
-	
-	
-	
-	
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®	
124 Ω (integrated and ready to be switched)	
≤ 1000 kbps	
≤ 5000 m (dependent on the data rate and the protocol used)	
COMBICON plug-in screw terminal block	
± 35%	
< 6.25%	
< 1 bit (configurable)	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
(VCC // CAN A // CAN B)	
35 mm / 107 mm / 121 mm	
Ex II 3 G Ex nA IIC T4 Gc X	
508 listed	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-REP-DNET CAN[1])	**2313423**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Segment coupler
for DeviceNet™ and CANopen®

Ex:

Technical data

24 V DC	
55 mA (24 V DC)	
-	
-	
-	
-	
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®	
124 Ω (integrated and ready to be switched)	
≤ 1000 kbps	
≤ 5000 m (dependent on the data rate and the protocol used)	
COMBICON plug-in screw terminal block	
± 35%	
< 6.25%	
≤ 108 bit	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
(VCC // CAN A // CAN B)	
35 mm / 107 mm / 121 mm	
Ex II 3 G Ex nA IIC T4 Gc X	
508 listed	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-SC-DNET CAN[1])	**2313449**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Bridge
for DeviceNet™ and CANopen®

Ex:

Technical data

24 V DC	
55 mA (24 V DC)	
RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
150 Ω	
≤ 500 kbps	
≤ 1200 m (dependent on the data rate)	
COMBICON plug-in screw terminal block	
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®	
124 Ω (integrated and ready to be switched)	
≤ 1000 kbps	
≤ 5000 m (dependent on the data rate and the protocol used)	
COMBICON plug-in screw terminal block	
± 35%	
< 6.25%	
-	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
(VCC // CAN // RS-422)	
35 mm / 107 mm / 121 mm	
Ex II 3 G Ex nA IIC T4 Gc X	
508 listed	

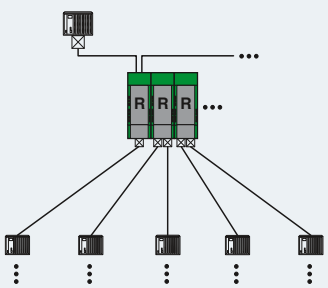
Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-BRIDGE-DNET CAN[1])	**2313533**	1

Accessories

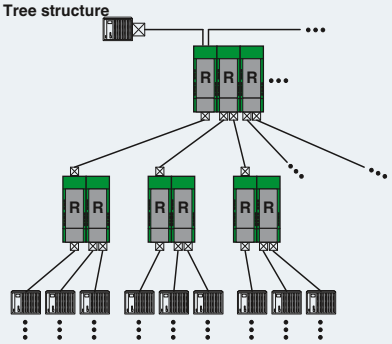
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Star structure



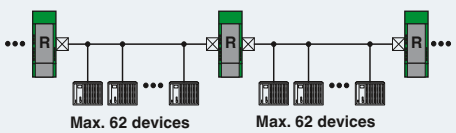
☒= Switch on bus termination resistor

Tree structure



☒= Switch on bus termination resistor

Linear structure



☒= Switch on bus termination resistor

Interface isolator

RS-232 / RS-232 interface isolator

The V.24 (RS-232) interface is an asymmetric voltage interface (common signal ground for all signals). As well as having a very low signal power, the signal ground is connected to ground potential. This results in very little immunity to interference and a maximum range of 15 m.

A considerably higher level of immunity to interference can be achieved in industrial applications by using V.24 (RS-232) isolator modules. The high-quality 3-way isolation results in an electrically isolated and interference-proof V.24 (RS-232) interface. This decoupling also protects the expensive terminal devices against damage.

Features:

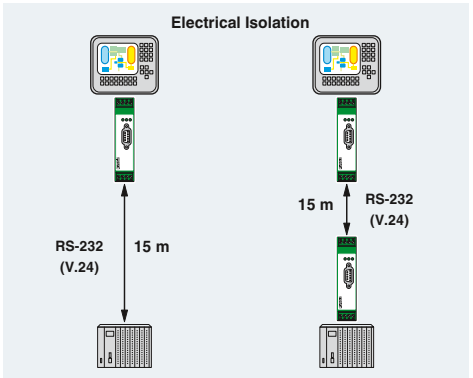
– High-quality 3-way isolation up to 2 kV (VCC // V.24 (RS-232) // V.24 (RS-232))
– Max. transmission rate of up to 115.2 kbps
– 24 V DC or AC power supply suitable for control cabinet
– Mounting on standard EN DIN rails
– Integrated surge protection with transient discharge to the DIN rail
– In the case of variable cable lengths, the V.24 (RS-232) connection on the field side can be established conveniently using plug-in screw terminal blocks
– Transmission of TxD/RxD data channels and RTS/CTS control lines
– Active data transmission indicated by separate data indicators for the transmit and receive channels

Application:

– Higher level of immunity to interference for industrial conditions
– Compensating currents avoided through electrical isolation
– Protection of expensive terminal devices through decoupling
– Optimum protection of both interface sides thanks to two V.24 (RS-232)/V.24 (RS-232) interface isolators

Notes:

1) EMC: Class A product, see page 553



V.24 (RS-232) interface isolator

Ex: cULus // Applied for: cUL / UL

Technical data

Supply		
Supply voltage		24 V AC/DC ±20%
Nominal current consumption		40 mA (24 V DC)
V.24 (RS-232) interface		V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission speed		115.2 kbps
Transmission length		15 m (twisted pair)
Connection method		D-SUB-9 plug Plug-in screw connection
General data		
Bit distortion		< 5%
Bit delay		< 3 µs
Test voltage		2 kV
Ambient temperature range		0 °C ... 55 °C
Housing material		PA
Transmission channels		4 (2/2), RxD, TxD, RTS, CTS ; full duplex
Electrical isolation		(VCC // V.24 (RS-232) (A) // V.24 (RS-232) (B))
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm
Conformance / approvals		
UL, USA / Canada		508 recognized Class I, Div. 2, Groups A, B, C, D

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Interface isolator, for electrical isolation of RS-232 (V.24) interfaces, four channels, rail-mountable	**PSM-ME-RS232/RS232-P[1])**	**2744461**	1

Accessories

RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1

Interface converters

RS-232 / TTY interface converter

This converter converts a V.24 (RS-232) interface into a 20 mA TTY current loop interface bidirectionally.

The interference immune TTY signal allows problem-free data transmission over distances of up to 1000 m using a twisted-pair and shielded 4-wire cable.

Features:

- Conversion of V.24 (RS-232) TxD/RxD full duplex data signals into the TTY current loop standard
- Semi-active, active or passive TTY operating mode, depending on pin assignment
- Transmission speed of up to 19.2 kbps
- Transmission distances of up to 1000 m in active TTY mode
- 24 V DC or AC power supply suitable for control cabinet
- Active data transmission indicated by separate data indicators for the transmit and receive channels
- Convenient connection for variable cable lengths, enabling the TTY connection on the field side to be established via plug-in screw terminal blocks
- V.24 (RS-232) connection via D-SUB 9 and standard V.24 (RS-232) cable
- High-quality 3-way isolation up to 2 kV (VCC // V.24 (RS-232) // TTY)
- Mounting on standard EN DIN rails
- Integrated surge protection with transient discharge to the DIN rail

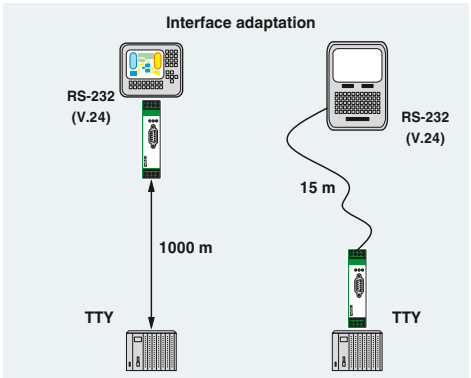
Application:

The following tasks are generally solved with the converters (see illustration):

- Interface adaptation between V.24 (RS-232) and TTY interfaces
- Increased range of up to 1000 m
- Programming connection between PC (V.24 (RS-232)) and, for example, S5 controllers with TTY programming interface for temporary coupling

Notes:

1) EMC: Class A product, see page 553



TTY converter, 2 channels

Ex: // Applied for: cUL / UL

Technical data

Supply		
Supply voltage		24 V AC/DC ±20%
Nominal current consumption		75 mA (24 V DC)
V.24 (RS-232) interface		V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission speed		≤ 19.2 kbps
Transmission length		15 m (twisted pair)
Connection method		D-SUB-9 plug
TTY interface		TTY interface, CL2 in acc. with DIN 66348-1
Transmission speed		≤ 19.2 kbps
Transmission length		1000 m (twisted pair)
Connection method		Plug-in screw connection
Operating mode		Active, semi active, passive
Load		≤ 500 Ω
General data		
Bit distortion		< 5%
Bit delay		< 3 µs
Test voltage		2 kV
Ambient temperature range		0 °C ... 55 °C
Housing material		PA
Transmission channels		2 (1/1), RxD, TxD, full duplex
Electrical isolation		(VCC // V.24 (RS-232) // TTY)
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm
Conformance / approvals		
UL, USA / Canada		508 recognized Class I, Div. 2, Groups A, B, C, D

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Interface converter, for conversion from RS-232 (V.24) to TTY, with electrical isolation, two channels, rail-mountable	**PSM-ME-RS232/TTY-P**[1]	**2744458**	1

Accessories

RS-232-D-SUB cable, length: 2 m			
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1

Interface converters
RS-232 (V.24) / RS-422 (V.11)
RS-232 (V.24) / RS-485

The RS-422 standard can be used to set up rapid, interference-free point-to-point connections in industrial applications. Connections covering a distance of up to 1200 m can be established using a twisted-pair and shielded 4-wire cable.

The RS-485 standard allows more than two devices to communicate with one another. Converting the V.24 (RS-232) point-to-point interface into the bus-capable RS-485 standard makes it possible to network up to 32 devices via a 2 or 4-wire cable.

PSM-ME-RS232/RS485-P

This interface converter converts TxD/RxD data signals with speeds of up to 115.2 kbps on the V.24 (RS-232) interface bidirectionally into either RS-422 or RS-485 signals. The V.24 (RS-232) connection is established via a 9-pos. D-SUB, and the RS-422/RS-485 field connection is established using COMBICON plug-in screw terminal blocks.

Features:
- RS-422 4-wire point-to-point mode
- RS-485 2-wire mode, half duplex
- RS-485 4-wire mode, full duplex
- Automatic RS-485 transmit/receive changeover
- Transmission speed between 4.8 kbps and 115.2 kbps
- Integrated data indicator for dynamic indication of send and receive data
- High-quality 3-way isolation between power supply, V.24 (RS-232), and RS-422/485 for reliable decoupling of the potentials with 2 kV
- Integrated surge protection with transient discharge to the DIN rail

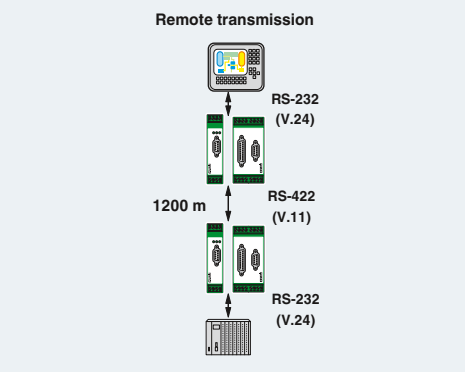
Applications:
- Fast and interference-free point-to-point connection between two V.24 (RS-232) interfaces via RS-422
- Increase in range or remote transmission up to 1200 m
- Programming or parameterizing link between PC (V.24 (RS-232)) and a piece of equipment such as a PLC or variable frequency drive with an RS-422 connection
- A temporary programming or parameterizing link can be set up between a PC (V.24 (RS-232)) and a piece of equipment such as a PLC or variable frequency drive with an RS-485 connection

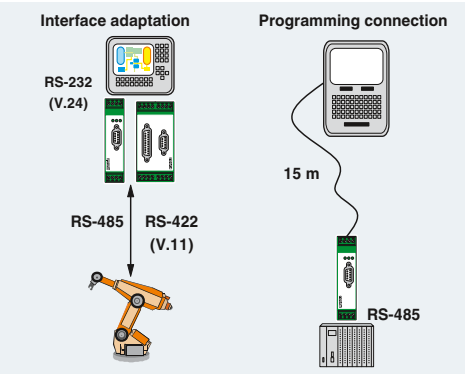
PSM-EG-RS 232/RS 422-P/4K

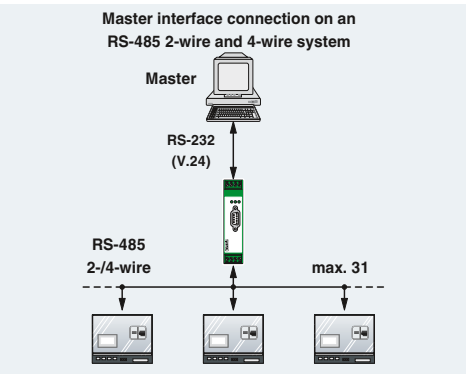
The PSM-EG... control cabinet module also converts the V.24 (RS-232) signals in full duplex mode with a data rate of up to 64 kbps to the powerful RS-422 standard. However, in addition to the TxD/RxD transmit and receive channels, the converter also provides two further channels for transmitting RTS and CTS control lines.

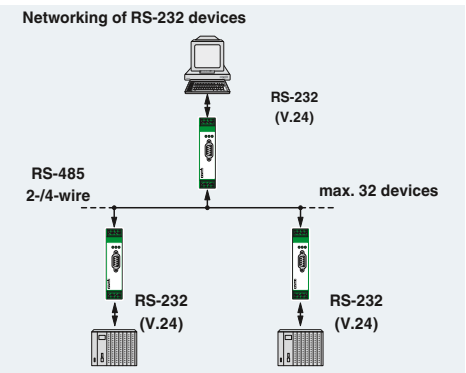
Features:
- RS-422 4-wire point-to-point mode
- High-quality 3-way isolation between power supply, V.24 (RS-232), and RS-422 for reliable electrical isolation of the potentials with 2.5 kV
- Integrated surge protection with transient discharge to the DIN rail
- Transmission speed of up to 64 kbps

Applications:
- Fast and interference-free point-to-point connection between two V.24 (RS-232) interfaces via RS-422
- Programming or parameterizing link between PC (V.24 (RS-232)) and a piece of equipment such as a PLC or variable frequency drive with an RS-422 connection
- Increased range of up to 1200 m, incl. control cables



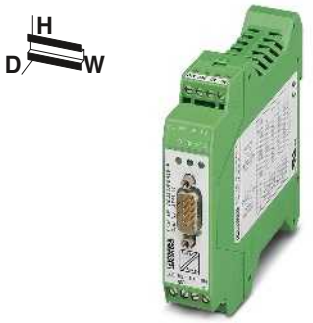






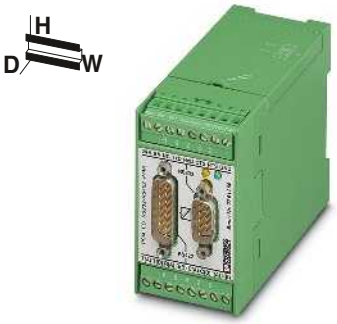
Notes:

1) EMC: Class A product, see page 553



V.24 (RS-232) converter for RS-422 and RS-485, 2 channels

Ex: cULus // Applied for: cUL / UL



V.24 (RS-232) converter for RS-422, 4 channels

cULus

		Technical data	Technical data
Supply			
Supply voltage		24 V AC/DC ±20%	24 V DC ±20%
Nominal current consumption		85 mA (24 V DC)	130 mA (24 V DC)
V.24 (RS-232) interface		V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission speed		115.2 kbps	64 kbps
Connection method		D-SUB-9 plug	D-SUB-9 plug
RS-422 interface		RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
Termination resistor		390 Ω / 180 Ω / 390 Ω (can be connected)	510 Ω / 150 Ω / 510 Ω (can be connected)
Transmission speed		115.2 kbps	64 kbps
Transmission length		1200 m (twisted pair)	1200 m (twisted pair)
Connection method		Plug-in screw connection	D-SUB-15 plug
RS-485 interface		RS-485 interface in acc. with EIA/TIA-485, DIN 66259-1	
Data direction switching		Automatic control or via RTS/CTS	-
Termination resistor		390 Ω / 180 Ω / 390 Ω (can be connected)	-
Transmission length		1200 m (twisted pair)	-
Connection method		Plug-in screw connection	-
General data			
Bit distortion		≤ 5%	≤ 5%
Bit delay		≤ 3 µs	≤ 3 µs
Test voltage		2 kV	2.5 kV
Ambient temperature range		0 °C ... 55 °C	0 °C ... 50 °C
Housing material		PA	ABS
Transmission channels		2 (1/1), RxD, TxD, full duplex	4 (2/2), RxD, TxD, RTS, CTS ; full duplex
Electrical isolation		(VCC // V.24 (RS-232) // RS-485)	(VCC // V.24 (RS-232) // RS-422)
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm	45 mm / 75 mm / 110 mm
Conformance / approvals			
UL, USA / Canada		508 recognized Class I, Div. 2, Groups A, B, C, D	cUL 508 recognized

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Interface converter, for conversion from RS-232 (V.24) to RS-485, with electrical isolation, rail-mountable, changeover of data direction self-controlling or through RTS/CTS						
- 2 channels	**PSM-ME-RS232/RS485-P**[1])	**2744416**	1			
Interface converter, for conversion from RS-232 (V.24) to RS-422 (V.11), with electrical isolation, rail-mountable						
- 4 channels				**PSM-EG-RS232/RS422-P/4K**[1])	**2761266**	1
	Accessories			**Accessories**		
RS-232-D-SUB cable, length: 2 m						
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1	**PSM-KA9SUB9/BB/2METER**	**2799474**	1

FO converters for PROFIBUS

The **PSI-MOS-PROFIB/FO...** devices convert copper-based PROFIBUS interfaces to fiber optics.

The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and also during operation. The floating switch contact is activated when the signal output on the fiber optic paths drops to a critical level.

Depending on which wavelength is used in conjunction with the corresponding fibers, transmission distances of 70 m to 45 km can be achieved between two devices. Depending on the wavelength, devices can be used with polymer, HCS, and fiberglass.

- Automatic data rate detection or fixed data rate setting via DIP switches
- Suitable for all data rates of up to 12 Mbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (PROFIBUS // fiber optic ports // power supply // DIN rail connector)
- Bit retiming for any cascading depth
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- Can be combined with the PSI copper repeater for PROFIBUS in a modular way using DIN rail connectors

The **PSI-MOS-PROFIB/FO... E** terminal devices convert a PROFIBUS interface to a **FO cable**. They are ideal for point-to-point connections.

The **PSI-MOS-PROFIB/FO...** T T-couplers allow the interface to be converted to two **FO cables**. They can be used to create linear structures and ring structures for increased system availability.

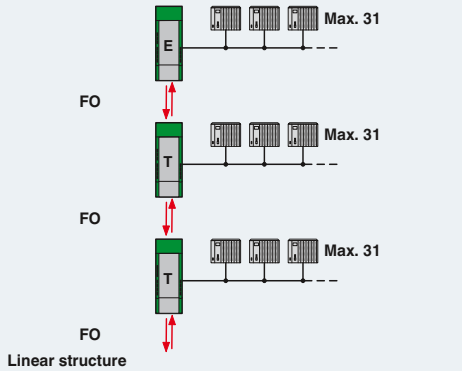
Notes:

1) EMC: Class A product, see page 553

Supply	
Supply voltage range	
Nominal current consumption	
RS-485 interface	
Data format/coding	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal device, for converting data signals from PROFIBUS FMS/DP **to an FO cable**
T-coupler, for converting data signals from PROFIBUS FMS/DP **to two FO cables**

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through the supply voltage, 2 required per device
System power supply unit, primary-switched



PROFIBUS
polymer and HCS fibers

Ex:

Technical data

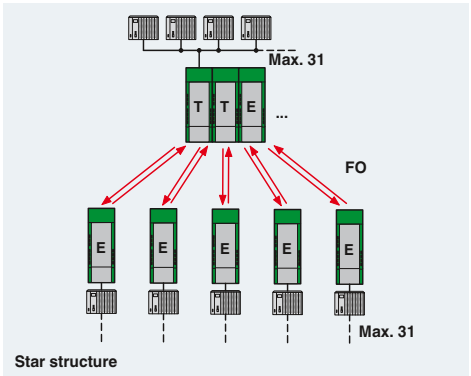
18 V DC ... 30 V DC	
100 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
F-SMA	
660 nm	
70 m (with F-P 980/1000 230 dB/km with quick mounting connector)	
400 m (with F-K 200/230 10 dB/km with quick mounting connector)	
< 1 bit	
-20 °C ... 60 °C	
35 mm / 99 mm / 106 mm	
II 3 G Ex nAC IIC T4 X	
II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5	
Class I, Zone 2, Ex nC nL IIC T5 X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

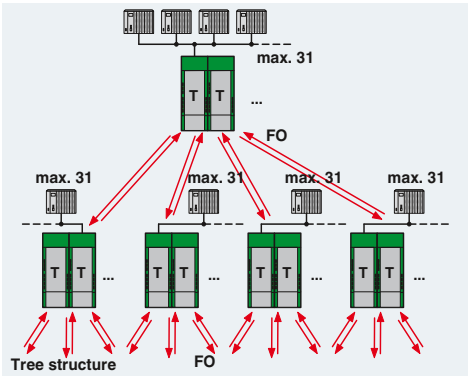
Type	Order No.	Pcs. / Pkt.
PSI-MOS-PROFIB/FO 660 E[1])	2708290	1
PSI-MOS-PROFIB/FO 660 T[1])	2708287	1

Accessories

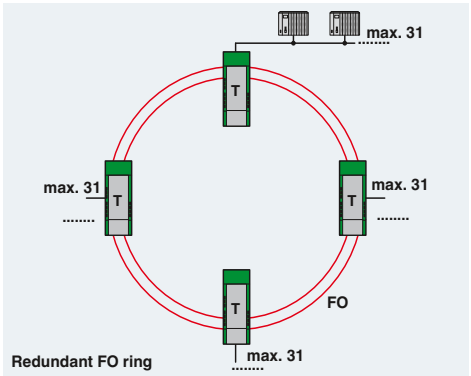
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Star structure



Tree structure



Redundant FO ring

PROFIBUS
HCS and fiberglass
(multi mode)

Ex:

Technical data

18 V DC ... 30 V DC	
120 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
B-FOC (ST®)	
850 nm	
2600 m (with F-G 50/125 2.5 dB/km)	
3300 m (with F-G 62.5/125 3.0 dB/km)	
800 m (with F-K 200/230 10 dB/km with quick mounting connector)	
< 1 bit	
-20 °C ... 60 °C	
35 mm / 99 mm / 106 mm	
II 3 G Ex nAC IIC T4 X	
II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5	
Class I, Zone 2, Ex nC nL IIC T5 X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-PROFIB/FO 850 E[1])	2708274	1
PSI-MOS-PROFIB/FO 850 T[1])	2708261	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

PROFIBUS
fiberglass
(multi mode and single mode)

Technical data

18 V DC ... 32 V DC	
170 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
SC duplex	
1300 nm	
25 km (with F-G 50/125 0.7 dB/km at 1300 nm)	
22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)	
45 km (with F-E 9/125 0.4 dB/km at 1300 nm)	
< 1 bit	
-20 °C ... 60 °C	
35 mm / 105 mm / 106 mm	
II 3 G Ex nA nC IIC T4 Gc X	
508 listed	
508 recognized	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-PROFIB/FO1300 E[1])	2708559	1
PSI-MOS-PROFIB/FO1300 T[1])	2708892	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

FO converters for ControlNet™

With the infrastructure components for ControlNet™, copper-based and fiber optic networks can benefit from the advantages of active devices. The main advantage is the electrically isolated connection of bus devices, which means that the negative effects of voltage equalization currents and electromagnetic interference on the bus cables are a thing of the past. In addition, bus cable short circuits only affect the specific potential segment concerned. In addition to interference-free and electrically isolated networking, the use of fiber optic technology also enables longer branch lines and star and tree structures to be created.

- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (ControlNet™ // fiber optic ports // power supply // DIN rail connector)
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- Can be combined with the PSI copper repeater in a modular way using DIN rail connectors

The **PSI-MOS-CNET/FO... E** terminal device converts a PROFIBUS interface to a **fiber optic cable**. It is ideal for point-to-point connections.

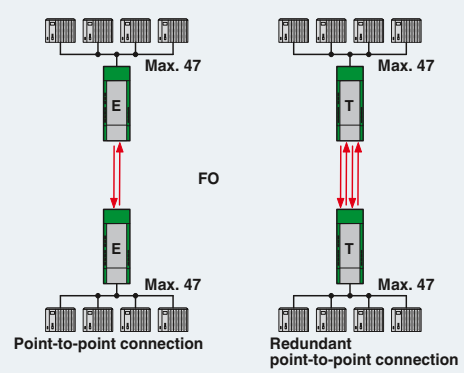
The **PSI-MOS-CNET/FO... T** T-coupler allows the interface to be converted to **two FO cables**. This device can be used to create redundant network structures for increased system availability.

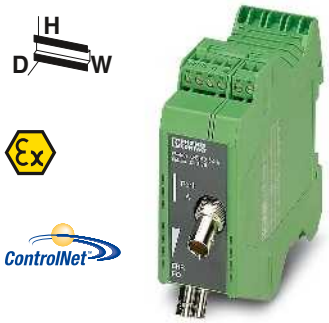
Notes:

1) EMC: Class A product, see page 553

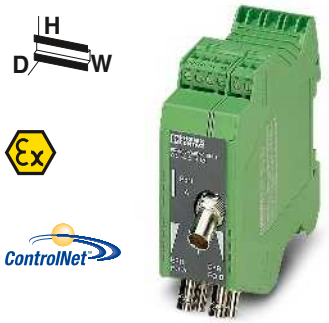
Supply	
Supply voltage range	
Nominal current consumption	
ControlNet™ interface	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Electrical isolation	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Fiber optic converter, termination device for converting data signals to a fiber optic cable
Fiber optic converter, T-coupler for converting data signals to two fiber optic cables
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
System power supply unit, primary-switched





ControlNet™, one optical channel



ControlNet™, two optical channels

Ex:

Ex:

Technical data

18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
100 mA (24 V DC)	100 mA (24 V DC)
ControlNet™ interface, according to EN 50170	ControlNet™ interface, according to EN 50170
5 Mbps	5 Mbps
≤ 1000 m	≤ 1000 m
BNC 75 Ω	BNC 75 Ω
B-FOC (ST®)	B-FOC (ST®)
850 nm	850 nm
1200 m (with F-K 200/230 8 dB/km with quick mounting connector) 3100 m (with F-G 50/125 2.5 dB/km) 3000 m (with F-G 62.5/125 3.0 dB/km)	1200 m (with F-K 200/230 8 dB/km with quick mounting connector) 3100 m (with F-G 50/125 2.5 dB/km) 3000 m (with F-G 62.5/125 3.0 dB/km)
< 3 bit	< 3 bit
18 V DC ... 30 V DC, 500 mA	18 V DC ... 30 V DC, 500 mA
1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C	-20 °C ... 60 °C
(VCC // ControlNet™)	(VCC // ControlNet™)
35 mm / 105 mm / 117 mm	35 mm / 105 mm / 117 mm
II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II 3 G Ex nA IIC T4 Gc X	II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II 3 G Ex nA IIC T4 Gc X
508 listed	508 listed

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-CNET/FO 850 E[1])	**2313711**	1

Accessories

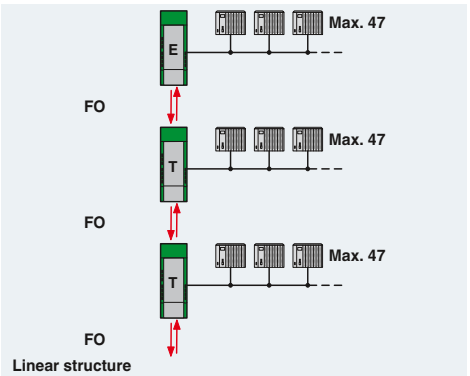
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

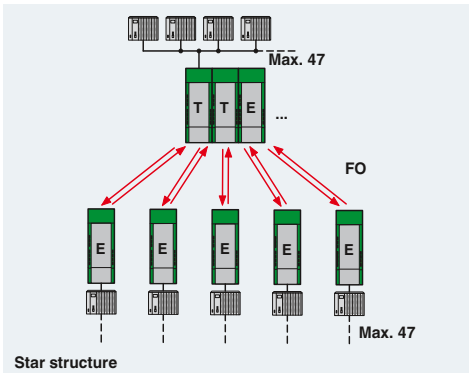
Ordering data

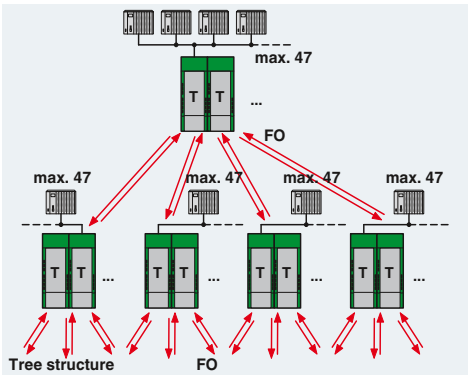
Type	Order No.	Pcs. / Pkt.
PSI-MOS-CNET/FO 850 T[1])	**2313724**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1







FO converters for DeviceNet™ and CANopen®

The PSI-MOS-DNET... fiber optic transmission system enables DeviceNet™ and CANopen® users to benefit from simple and interference-free networking based on fiber optics. In addition, bus cable short circuits only affect the specific potential segment concerned. This increases overall availability, and improves flexibility when designing the bus topology. The use of fiber optic technology enables branch lines and star and tree structures to be created.

The 22.5 mm space-saving devices from the **PSI-MOS-DNET CAN/FO…** series feature an internal backplane. The maximum network expansion that can be achieved (sum total of copper and fiber optic cables) essentially depends on the data rate used.

- Data rates of up to 800 kbps, set via DIP switches
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact in basic module for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (DeviceNet™ // fiber optic port // power supply // backplane)
- Integrated backplane for routing through the supply voltage and data signals

Thanks to extended functions, the modular devices in the **PSI-MOS-DNET/FO…** series support network expansion that is not dependent on the data rate.

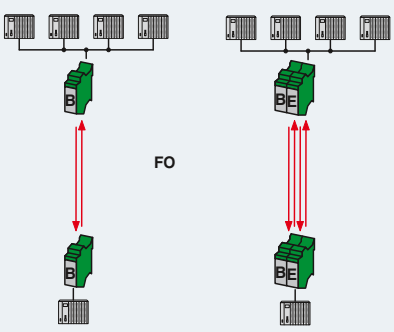
- Automatic data rate detection or fixed data rate setting via DIP switches
- Data rates of up to 1000 kbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (DeviceNet™ // fiber optic ports // power supply // DIN rail connector)
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- Can be combined with the PSI copper repeater in a modular way using DIN rail connectors

Notes:

1) EMC: Class A product, see page 553

Supply	
Supply voltage range	
Nominal current consumption	
CAN interface	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Basic module for conversion of the CAN-based interface **to a fiber optics interface**
Extension module with a fiber optics interface
FO converter, terminal device for converting a CAN-based interface to a fiber optic cable
FO converter, T-coupler for converting a CAN-based interface to two fiber optic cables



Branch line / redundant branch line

DeviceNet™ and CANopen®
Polymer and HCS fibers

Ex:

Technical data

10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
100 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®
120 Ω (can be connected)
≤ 800 kbps
≤ 5000 m (dependent on the data rate and the protocol used)
Plug-in screw connection
F-SMA
660 nm
100 m (with F-P 980/1000 230 dB/km with quick mounting connector) 800 m (with F-K 200/230 10 dB/km with quick mounting connector)
< 1 bit
60 V DC / 42 V AC, 0.46 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
22.5 mm / 99 mm / 114.5 mm
II 3 G Ex nAC IIC T4 X II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
Class I, Zone 2, AEx nc IIC T5 Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-DNET CAN/FO 660/BM[1])	**2708054**	1
PSI-MOS-DNET CAN/FO 660/EM[1])	**2708067**	1

DeviceNet™ and CANopen®
HCS and fiberglass
(multi mode)

Ex:

Technical data

10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
100 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®
120 Ω (can be connected)
≤ 800 kbps
≤ 5000 m (dependent on the data rate and the protocol used)
Plug-in screw connection
B-FOC (ST®)
850 nm
2800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4800 m (with F-G 50/125 2.5 dB/km) 4200 m (with F-G 62.5/125 3.0 dB/km)
< 1 bit
60 V DC / 42 V AC, 0.46 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
22.5 mm / 99 mm / 114.5 mm
II 3 G Ex nAC IIC T4 X II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
Class I, Zone 2, AEx nc IIC T5 Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-DNET CAN/FO 850/BM[1])	**2708083**	1
PSI-MOS-DNET CAN/FO 850/EM[1])	**2708096**	1

DeviceNet™ and CANopen®
HCS and fiberglass
(multi mode) external backplane

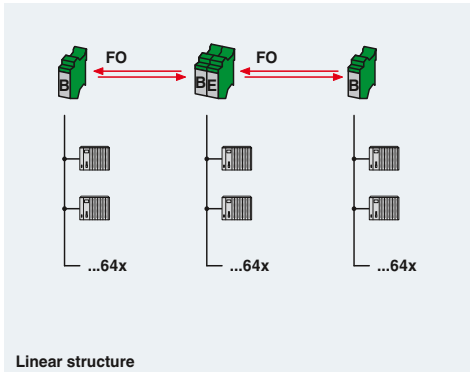
Ex:

Technical data

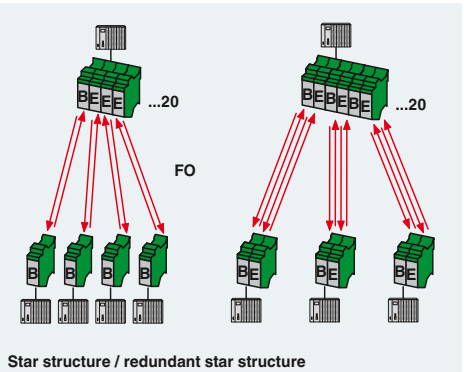
11 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
130 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®
124 Ω (integrated and ready to be switched)
≤ 1000 kbps
≤ 5000 m (dependent on the data rate and the protocol used)
COMBICON plug-in screw terminal block
B-FOC (ST®)
850 nm
1800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4600 m (with F-G 50/125 2.5 dB/km) 4200 m (with F-G 62.5/125 3.0 dB/km)
< 1 bit (configurable)
-
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
35 mm / 102 mm / 119 mm
II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II 3 G Ex nA IIC T4 Gc X 508 listed

Ordering data

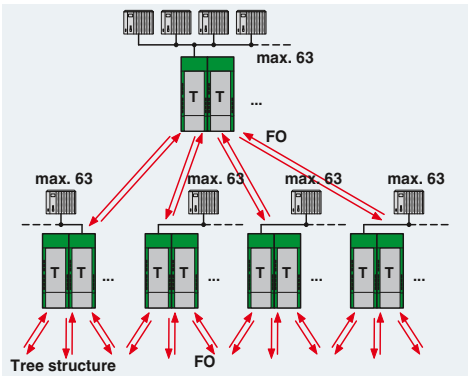
Type	Order No.	Pcs. / Pkt.
PSI-MOS-DNET/FO 850 E[1])	**2313999**	1
PSI-MOS-DNET/FO 850 T[1])	**2313986**	1



Linear structure



Star structure / redundant star structure



Tree structure

Fiber optic converters for RS-485 2-wire bus systems

The RS-485 2-wire interface is the most widely used interface in the field of automation technology. Well-known bus systems, such as SUCONET K, Modbus ASCII, Modbus RTU, S-BUS, and DH-485, are all based on this interface, as are many other company-specific bus systems.

The **PSI-MOS-RS485W2/FO...** FO converters convert the electrical data signal into an optical one by protocol transparent means.

The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and also during operation. The floating switch contact is activated when the signal output on the fiber optic paths drops to a critical level.

Depending on which wavelength is used in conjunction with the corresponding fibers, distances of 100 m to 45 km can be achieved between two devices.

- Automatic data rate detection or fixed data rate setting via DIP switches
- Suitable for data rates of up to 500 kbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (RS-485 // fiber optic ports // power supply // DIN rail connector)
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- Can be combined with the PSI copper repeater in a modular way using DIN rail connectors

The **PSI-MOS-RS485W2/FO... E** termination devices convert an RS-485 interface to a fiber optic cable. They are ideal for point-to-point connections.

The **PSI-MOS-RS485W2/FO... T** T-couplers allow the interface to be converted to **two FO cables**. They can be used to create linear structures and redundant structures for increased system availability.

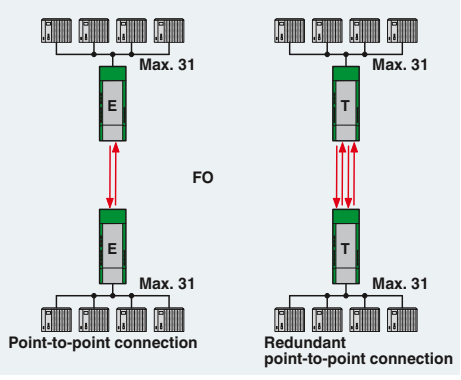
Notes:

1) EMC: Class A product, see page 553

Supply voltage range	
Nominal current consumption	
RS-485 interface	
Data format/coding	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal device, for converting data signals from RS-485 2-wire **to an FO cable**
T-coupler, for converting data signals from RS-485 2-wire **to two FO cables**

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through the supply voltage, 2 required per device
System power supply unit, primary-switched



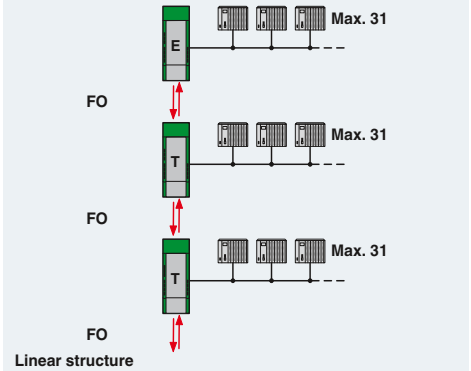
RS-485 2-wire
polymer and HCS fibers

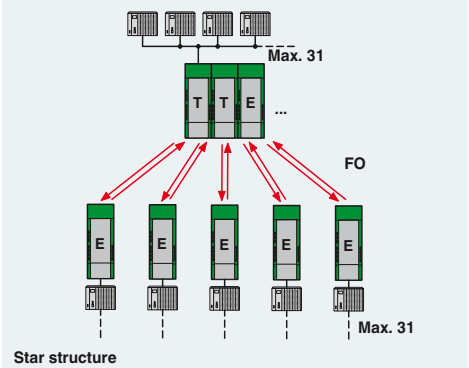
Ex:

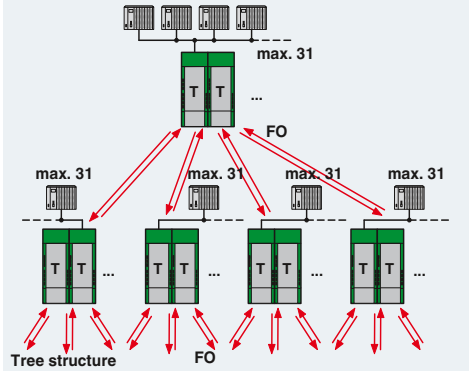
Technical data	
	18 V DC ... 30 V DC
	100 mA (24 V DC)
	RS-485 interface, 2-wire
	UART (11/10 bit switchable ; NRZ), slip-tolerant
	390 Ω / 220 Ω / 390 Ω (can be connected)
	4,8/ 9,6/ 19,2/ 38,4/ 57,6/ 75/ 93,75/ 115,2/ 136/ 187,5/ 375/ 500
	≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	F-SMA
	660 nm
	100 m (with F-P 980/1000 230 dB/km with quick mounting connector)
	800 m (with F-K 200/230 10 dB/km with quick mounting connector)
	< 1 bit
	60 V DC / 42 V AC, 0.46 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 105 mm
	II 3 G Ex nAC IIC T4 X
	II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
	Class I, Zone 2, AEx nc IIC T5
	Class I, Zone 2, Ex nC nL IIC T5 X
	Class I, Div. 2, Groups A, B, C, D

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
PSI-MOS-RS485W2/FO 660 E[1])	**2708313**	1
PSI-MOS-RS485W2/FO 660 T[1])	**2708300**	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1







RS-485 2-wire
HCS and fiberglass
(multi mode)

Ex:

Technical data	
	18 V DC ... 30 V DC
	120 mA (24 V DC)
	RS-485 interface, 2-wire
	UART (11/10 bit switchable ; NRZ), slip-tolerant
	390 Ω / 220 Ω / 390 Ω (can be connected)
	4,8/ 9,6/ 19,2/ 38,4/ 57,6/ 75/ 93,75/ 115,2/ 136/ 187,5/ 375/ 500
	≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	B-FOC (ST®)
	850 nm
	2800 m (with F-K 200/230 8 dB/km with quick mounting connector)
	4200 m (with F-G 50/125 2.5 dB/km)
	3300 m (with F-G 62.5/125 3.0 dB/km)
	< 1 bit
	60 V DC / 42 V AC, 0.46 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 105 mm
	II 3 G Ex nAC IIC T4 X
	II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
	Class I, Zone 2, AEx nc IIC T5
	Class I, Zone 2, Ex nC nL IIC T5 X
	Class I, Div. 2, Groups A, B, C, D

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
PSI-MOS-RS485W2/FO 850 E[1])	**2708339**	1
PSI-MOS-RS485W2/FO 850 T[1])	**2708326**	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

RS-485 2-wire
fiberglass
(multi mode and single mode)

Technical data	
	18 V DC ... 32 V DC
	170 mA (24 V DC)
	RS-485 interface, 2-wire
	UART (11/10 bit switchable ; NRZ), slip-tolerant
	390 Ω / 220 Ω / 390 Ω (can be connected)
	4,8/ 9,6/ 19,2/ 38,4/ 57,6/ 75/ 93,75/ 115,2/ 136/ 187,5/ 375/ 500
	≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	SC duplex
	1300 nm
	25 km (with F-G 50/125 0.7 dB/km at 1300 nm)
	22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)
	45 km (with F-E 9/125 0.4 dB/km at 1300 nm)
	< 1 bit
	60 V DC / 42 V AC, 1 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 105 mm
	II 3 G Ex nA nC IIC T4 Gc X
	508 listed
	508 recognized

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
PSI-MOS-RS485W2/FO1300 E[1])	**2708562**	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Fiber optic converter for INTERBUS

The **PSI-MOS-RS422/FO...** devices are used for converting INTERBUS interfaces to fiber optics. The conversion is performed using a transparent protocol for all data rates up to max. 2 Mbps. The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and also during operation. The floating switch contact is activated when the signal output on the fiber optic paths drops to a critical level. This early alarm generation enables critical system states to be diagnosed before they result in failure.

- Automatic data rate detection for all data rates up to 2 Mbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (INTERBUS // fiber optic ports // power supply // DIN rail connector)
- Connections can be plugged in using a COMBICON screw terminal block
- Redundant power supply supported in the form of optional system power supply unit
- Routing through of the supply voltage via the DIN rail connector
- Approved for use in zone 2
- Intrinsically safe FO interface (Ex op is) for direct connection to devices in zone 1 (all 660 and 850 nm versions)

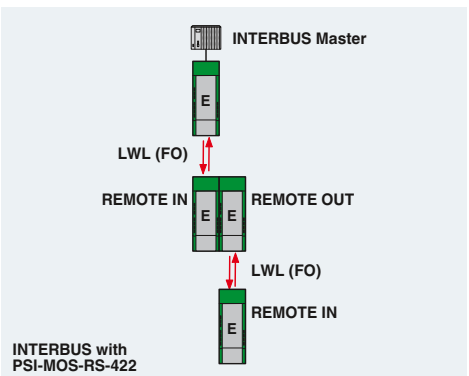
INTERBUS lines are constructed with the **PSI-MOS-RS422...E terminal devices**. The **PSI-MOS-RS422...T T-couplers** also allow redundant **INTERBUS connections** via fiber optics.

Notes:

1) EMC: Class A product, see page 553

Supply voltage range	
Nominal current consumption	
RS-422 interface	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal device, for converting data signals from RS-422 (V.11) /RS-485 4-wire **to an FO cable**
T-coupler, for converting data signals from RS-422 (V.11) /RS-485 4-wire to two FO cables
DIN rail connector, (optional), for routing through the supply voltage, 2 required per device
System power supply unit, primary-switched



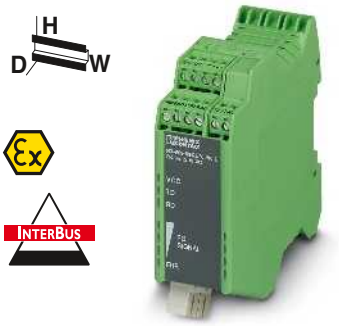
INTERBUS with PSI-MOS-RS-422

INTERBUS
polymer and HCS fibers

Ex: c UL us Ex

INTERBUS
HCS and fiberglass
(multi mode)

Ex: c UL us Ex



INTERBUS
fiberglass
(multi mode and single mode)

c UL us c UL us

Technical data

18 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 32 V DC
100 mA (24 V DC)	120 mA (24 V DC)	110 mA (24 V DC)
RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
≤ 1000 m (depending on the data rate, with shielded, twisted data cable)	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
Plug-in screw connection	Plug-in screw connection	Plug-in screw connection
F-SMA	B-FOC (ST®)	SC duplex
660 nm	850 nm	1300 nm
100 m (with F-P 980/1000 230 dB/km with quick mounting connector) 800 m (with F-K 200/230 10 dB/km with quick mounting connector)	2800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4200 m (with F-G 50/125 2.5 dB/km) 4800 m (with F-G 62.5/125 3.0 dB/km)	27 km (with F-G 50/125 0.7 dB/km at 1300 nm) 22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm) 45 km (with F-E 9/125 0.4 dB/km at 1300 nm)
< 1 bit	< 1 bit	< 1 bit
60 V DC / 42 V AC, 0.46 A	60 V DC / 42 V AC, 0.46 A	60 V DC / 42 V AC, 1 A
1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C	-20 °C ... 60 °C	-20 °C ... 60 °C
35 mm / 99 mm / 103 mm	35 mm / 99 mm / 103 mm	35 mm / 105 mm / 103 mm
Ex II 3 G Ex nAC IIC T4 X Ex II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	Ex II 3 G Ex nAC IIC T4 X Ex II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	Ex II 3 G Ex nA nC IIC T4 Gc X
Class I, Zone 2, AEx nc IIC T5 Class I, Zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D	Class I, Zone 2, AEx nc IIC T5 Class I, Zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D	508 listed 508 recognized

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO 660 E[1])	**2708342**	1
PSI-MOS-RS422/FO 660 T[1])	**2708384**	1

Accessories

ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO 850 E[1])	**2708355**	1
PSI-MOS-RS422/FO 850 T[1])	**2708397**	1

Accessories

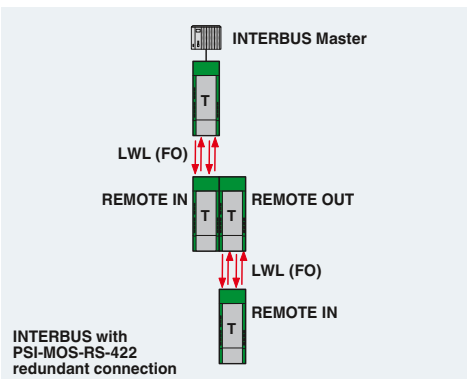
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO1300 E[1])	**2708575**	1

Accessories

ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1



INTERBUS with PSI-MOS-RS-422 redundant connection

FO converters for RS-422 and RS-485 4-wire bus systems

Data transfer via copper cables reaches its limits very quickly in an industrial environment. Particularly in applications with a high level of electromagnetic interference, interference-free communication can only be achieved with great complexity in terms of shielding and surge protection. The **PSI-MOS-RS422/FO...** devices convert copper for fiber optics. A transparent protocol is used for conversion.

- Automatic data rate detection for all data rates up to 2 Mbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (RS-422 // fiber optic ports // power supply // DIN rail connector)
- Connections can be plugged in using a COMBICON screw terminal block
- Redundant power supply supported in the form of optional system power supply unit
- Routing of supply voltage and data signals through DIN rail connectors
- Approved for use in zone 2
- Intrinsically safe FO interface (Ex op is) for direct connection to devices in zone 1 (all 660 and 850 nm versions)

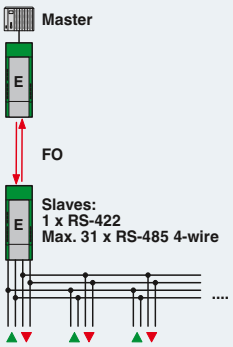
If RS-422 terminal devices are used, only one terminal device can be connected to each PSI-MOS-RS422/FO... device. If devices with an RS-485 4-wire interface are used, it is possible to create a network with up to 31 slave devices connected to one FO converter. In both cases, a suitable communication protocol capable of terminal device addressing is required (e.g., Modbus RTU).

Notes:

1) EMC: Class A product, see page 553

Supply voltage range	
Nominal current consumption	
RS-422 interface	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal device, for converting data signals from RS-422 (V.11) /RS-485 4-wire **to an FO cable**
T-coupler, for converting data signals from RS-422 (V.11) /RS-485 4-wire **to two FO cables**
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through he supply voltage, 2 required per device
System power supply unit, primary-switched



Point-to-point connection

RS-422/RS-485 4-wire polymer and HCS fibers

Ex:

Technical data

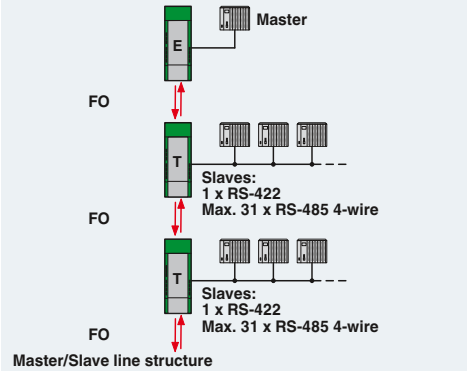
	18 V DC ... 30 V DC
	100 mA (24 V DC)
	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	F-SMA
	660 nm
	100 m (with F-P 980/1000 230 dB/km with quick mounting connector)
	800 m (with F-K 200/230 10 dB/km with quick mounting connector)
	< 1 bit
	60 V DC / 42 V AC, 0.46 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 103 mm
	II 3 G Ex nAC IIC T4 X
	II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
	Class I, Zone 2, AEx nc IIC T5
	Class I, Zone 2, Ex nC nL IIC T5 X
	Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO 660 E[1])	2708342	1
PSI-MOS-RS422/FO 660 T[1])	2708384	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Master/Slave line structure

RS-422/RS-485 4-wire HCS and fiberglass (multi mode)

Ex:

Technical data

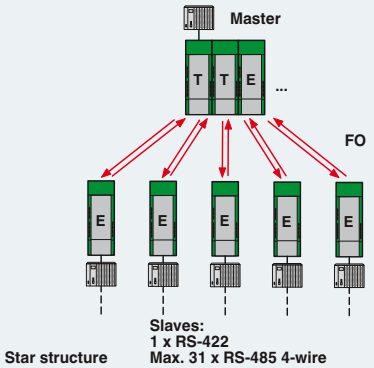
	18 V DC ... 30 V DC
	120 mA (24 V DC)
	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	B-FOC (ST®)
	850 nm
	2800 m (with F-K 200/230 8 dB/km with quick mounting connector)
	4200 m (with F-G 50/125 2.5 dB/km)
	4800 m (with F-G 62.5/125 3.0 dB/km)
	< 1 bit
	60 V DC / 42 V AC, 0.46 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 103 mm
	II 3 G Ex nAC IIC T4 X
	II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
	Class I, Zone 2, AEx nc IIC T5
	Class I, Zone 2, Ex nC nL IIC T5 X
	Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO 850 E[1])	2708355	1
PSI-MOS-RS422/FO 850 T[1])	2708397	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Star structure

RS-422/RS-485 4-wire fiberglass (multi mode and single mode)

Technical data

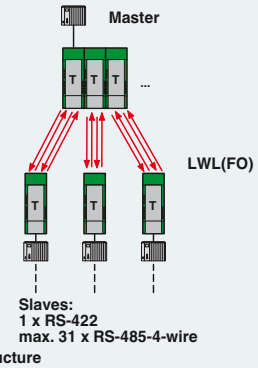
	18 V DC ... 32 V DC
	110 mA (24 V DC)
	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	SC duplex
	1300 nm
	27 km (with F-G 50/125 0.7 dB/km at 1300 nm)
	22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)
	45 km (with F-E 9/125 0.4 dB/km at 1300 nm)
	< 1 bit
	60 V DC / 42 V AC, 1 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 105 mm / 103 mm
	II 3 G Ex nA nC IIC T4 Gc X
	508 listed
	508 recognized

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO1300 E[1])	2708575	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Redundant structure

Fiber optic converters for RS-232 (V.24)

Due to its electrical properties, the V.24 (RS-232) is very susceptible to EMC influences and potential differences. For this reason, it can only be used for short distances of up to max. 15 m. FO transmission technology is, therefore, the first choice for longer transmission distances and for eliminating EMC influences. The **PSI-MOS-RS232/FO...** devices convert the V.24 (RS-232) interface for fiber optics. A transparent protocol is used for conversion. If addressable V.24 (RS-232) devices and a suitable communication protocol are used, even multi-point networks can be constructed. These can be implemented as linear, star, and even redundant star structures.

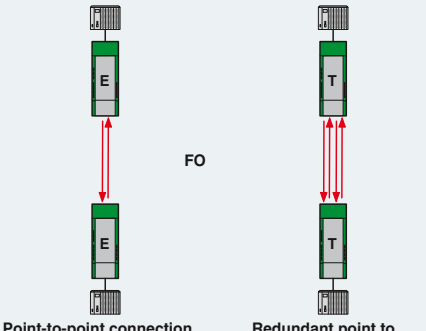
- Automatic data rate detection for all data rates up to 115.2 kbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (V.24 (RS-232) // fiber optic ports // power supply // DIN rail connector)
- Redundant power supply supported in the form of optional system power supply unit
- Connections can be plugged in using a COMBICON screw terminal block
- Routing of supply voltage and data signals through DIN rail connectors
- Approved for use in zone 2
- Intrinsically safe FO interface (Ex op is) for direct connection to devices in zone 1 (all 660 and 850 nm versions)

Notes:

1) EMC: Class A product, see page 553

Supply voltage range	
Nominal current consumption	
V.24 (RS-232) interface	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal equipment, for converting data signals from RS-232 (V.24) **to an FO cable**
T-coupler, for converting data signals from RS-232 (V.24) **to two FO cables**
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through the supply voltage, 2 required per device
System power supply unit, primary-switched



Point-to-point connection

Redundant point to point connection

RS-232

V.24 (RS-232) polymer and HCS fibers

Ex:

Technical data

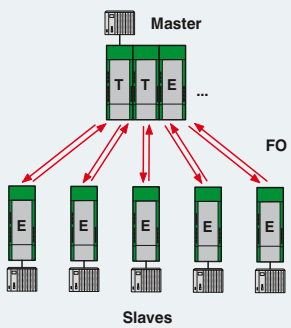
Supply voltage	18 V DC ... 30 V DC
Current consumption	100 mA (24 V DC)
Interface	V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission length	≤ 15 m
Connection	D-SUB-9 plug
Connection	F-SMA
Wavelength	660 nm
Transmission length	100 m (with F-P 980/1000 230 dB/km with quick mounting connector) 800 m (with F-K 200/230 10 dB/km with quick mounting connector)
Jitter	< 1 bit
Insulation voltage	60 V DC / 42 V AC, 0.46 A
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)
Ambient temperature (operation)	-20 °C ... 60 °C
Dimensions	35 mm / 99 mm / 105 mm
Approvals	II 3 G Ex nAC IIC T4 X II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U) Class I, Zone 2, AEx nc IIC T5 Class I, Zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS232/FO 660 E[1])	2708368	1
PSI-MOS-RS232/FO 660 T[1])	2708410	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Star structure

RS-232

V.24 (RS-232) HCS and fiberglass (multi mode)

Ex:

Technical data

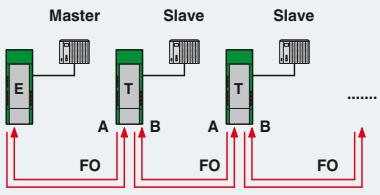
Supply voltage	18 V DC ... 30 V DC
Current consumption	120 mA (24 V DC)
Interface	V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission length	≤ 15 m
Connection	D-SUB-9 plug
Connection	B-FOC (ST®)
Wavelength	850 nm
Transmission length	2800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4200 m (with F-G 50/125 2.5 dB/km) 4800 m (with F-G 62.5/125 3.0 dB/km)
Jitter	< 1 bit
Insulation voltage	60 V DC / 42 V AC, 0.46 A
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)
Ambient temperature (operation)	-20 °C ... 60 °C
Dimensions	35 mm / 99 mm / 105 mm
Approvals	II 3 G Ex nAC IIC T4 X II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U) Class I, Zone 2, AEx nc IIC T5 Class I, Zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS232/FO 850 E[1])	2708371	1
PSI-MOS-RS232/FO 850 T[1])	2708423	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Master/Slave line structure

RS-232

V.24 (RS-232) fiberglass (multi mode and single mode)

Technical data

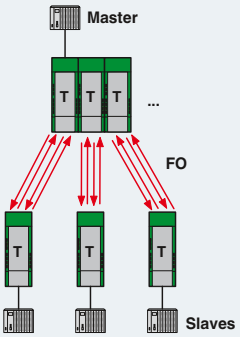
Supply voltage	18 V DC ... 32 V DC
Current consumption	100 mA (24 V DC)
Interface	V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission length	≤ 15 m
Connection	D-SUB-9 plug
Connection	SC duplex
Wavelength	1300 nm
Transmission length	27 km (with F-G 50/125 0.7 dB/km at 1300 nm) 22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm) 45 km (with F-E 9/125 0.4 dB/km at 1300 nm)
Jitter	< 1 bit
Insulation voltage	60 V DC / 42 V AC, 1 A
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)
Ambient temperature (operation)	-20 °C ... 60 °C
Dimensions	35 mm / 99 mm / 105 mm
Approvals	II 3 G Ex nA nC IIC T4 Gc X 508 listed 508 recognized

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS232/FO1300 E[1])	2708588	1

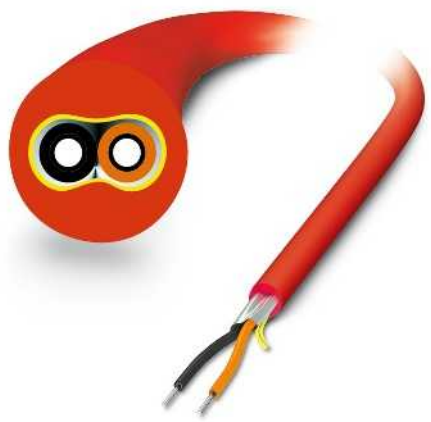
Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Redundant structure

Universal POF cable for assembly, type KDHEAVY-1011



- Universal installation cable for fixed installation indoors
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2744319	Variable	2901553	Variable	2901553
FSMA connector, IP20						
FSMA	Variable	2901553	Variable	2901553	Variable	2901553
SCRJ connectors, IP20						
SCRJ	Variable	2901553	Variable	2901553	Variable	2901553
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901553	Variable	2901553	Variable	2901553
SCRJ connector, IP67						
IP67	Variable	1402188	Variable	1402188	Variable	1402188
Push/pull SCRJ, plastic						
PPCPL	Variable	1402188	Variable	1402188	Variable	1402188
Push/pull SCRJ, metal						
PPCME	Variable	1402188	Variable	1402188	Variable	1402188

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402188	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

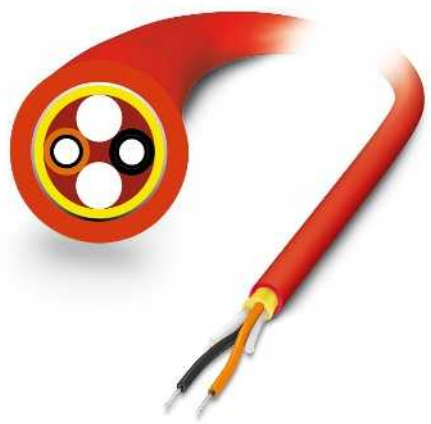
Order No.	Length [m]
2744319	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	SCRJ connector, IP67	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	IP67	PPCPL	PPCME
Ordering data	Ordering data	Ordering data	Ordering data
Order No.	Order No.	Order No.	Order No.
Variable 2901553	Variable 1402188	Variable 1402188	Variable 1402188
Variable 2901553	Variable 1402188	Variable 1402188	Variable 1402188
Variable 2901553	Variable 1402188	Variable 1402188	Variable 1402188
Variable 2901553	Variable 1402188	Variable 1402188	Variable 1402188
Variable 1402188	Variable 1402188		
Variable 1402188		Variable 1402188	
Variable 1402188			Variable 1402188

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 160A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	230 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	red
Diameter	5.5 - 6.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	black/orange
Diameter	2.2 mm ±0.07 mm
General data	
Weight	33 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Rugged POF cable for free assembly, type RUGGED-1012



- Rugged installation cable for fixed installation indoors
- Dimensioned for higher requirements in respect of tensile load and lateral pressure
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Reinforced polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2744322	Variable	2901548	Variable	2901548
FSMA connector, IP20						
FSMA	Variable	2901548	Variable	2901548	Variable	2901548
SCRJ connectors, IP20						
SCRJ	Variable	2901548	Variable	2901548	Variable	2901548
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901548	Variable	2901548	Variable	2901548
SCRJ connector, IP67						
IP67	Variable	1402185	Variable	1402185	Variable	1402185
Push/pull SCRJ, plastic						
PPCPL	Variable	1402185	Variable	1402185	Variable	1402185
Push/pull SCRJ, metal						
PPCME	Variable	1402185	Variable	1402185	Variable	1402185

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402185	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

Order No.	Length [m]
2744322	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	SCRJ connector, IP67	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	IP67	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**	**Order No.**
Variable **2901548**	Variable **1402185**	Variable **1402185**	Variable **1402185**
Variable **2901548**	Variable **1402185**	Variable **1402185**	Variable **1402185**
Variable **2901548**	Variable **1402185**	Variable **1402185**	Variable **1402185**
Variable **2901548**	Variable **1402185**	Variable **1402185**	Variable **1402185**
Variable **1402185**	Variable **1402185**		
Variable **1402185**		Variable **1402185**	
Variable **1402185**			Variable **1402185**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 160A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	230 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	red
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	black/orange
Diameter	2.2 mm ±0.07 mm
General data	
Weight	54 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Highly flexible POF cable for free assembly, type RUGGED-FLEX-1013

- Highly flexible round cable for use in trailing cables or drag chains
- Dimensioned for an alternating bending frequency of up to 5,000,000 cycles
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2744335	Variable	2901549	Variable	2901549
FSMA connector, IP20						
FSMA	Variable	2901549	Variable	2901549	Variable	2901549
SCRJ connectors, IP20						
SCRJ	Variable	2901549	Variable	2901549	Variable	2901549
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901549	Variable	2901549	Variable	2901549
SCRJ connector, IP67						
IP67	Variable	1402187	Variable	1402187	Variable	1402187
Push/pull SCRJ, plastic						
PPCPL	Variable	1402187	Variable	1402187	Variable	1402187
Push/pull SCRJ, metal						
PPCME	Variable	1402187	Variable	1402187	Variable	1402187

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402187	/ SCRJ	/ PPCPL	/ 15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

Order No.	Length [m]
2744335	/ 70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	SCRJ connector, IP67	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	IP67	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**	**Order No.**
Variable **2901549**	Variable **1402187**	Variable **1402187**	Variable **1402187**
Variable **2901549**	Variable **1402187**	Variable **1402187**	Variable **1402187**
Variable **2901549**	Variable **1402187**	Variable **1402187**	Variable **1402187**
Variable **2901549**	Variable **1402187**	Variable **1402187**	Variable **1402187**
Variable **1402187**	Variable **1402187**		
Variable **1402187**		Variable **1402187**	
Variable **1402187**			Variable **1402187**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 180A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	275 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	red
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	black/orange
Diameter	2.2 mm ±0.07 mm
General data	
Weight	54 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

PROFINET B POF cable for free assembly, type PN-B-1000

- Universal installation cable for fixed installation indoors
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath
- PROFINET type B

Ethernet

	free end	FSMA connector, IP20	SCRJ connector, IP20
	OE	FSMA	SCRJ
	Ordering data	Ordering data	Ordering data
	Order No.	Order No.	Order No.
free end			
OE	By the meter 2313397	Variable 2901551	Variable 2901551
FSMA connector, IP20			
FSMA	Variable 2901551	Variable 2901551	Variable 2901551
SCRJ connectors, IP20			
SCRJ	Variable 2901551	Variable 2901551	Variable 2901551
B-FOC (ST®) connector, IP20			
BFOC	Variable 2901551	Variable 2901551	Variable 2901551
Push/pull SCRJ, plastic			
PPCPL	Variable 1402172	Variable 1402172	Variable 1402172
Push/pull SCRJ, metal			
PPCME	Variable 1402172	Variable 1402172	Variable 1402172

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402172	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

Order No.	Length [m]
2313397	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**
Variable **2901551**	Variable **1402172**	Variable **1402172**
Variable **2901551**	Variable **1402172**	Variable **1402172**
Variable **2901551**	Variable **1402172**	Variable **1402172**
Variable **2901551**	Variable **1402172**	Variable **1402172**
Variable **1402172**	Variable **1402172**	
Variable **1402172**		Variable **1402172**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 160A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	230 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	Green
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	Black and orange with arrow labeling
Diameter	2.2 mm ±0.07 mm
General data	
Weight	49 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Highly flexible PROFINET C POF cable for free assembly, type PN-C-1003

- Highly flexible round cable for use in trailing cables or drag chains
- Dimensioned for an alternating bending frequency of up to 5,000,000 cycles
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath
- PROFINET type C

Ethernet

		free end		FSMA connector, IP20		SCRJ connector, IP20	
		OE		FSMA		SCRJ	
		Ordering data		Ordering data		Ordering data	
			Order No.		Order No.		Order No.
free end	OE	By the meter	2313407	Variable	2901552	Variable	2901552
FSMA connector, IP20	FSMA	Variable	2901552	Variable	2901552	Variable	2901552
SCRJ connectors, IP20	SCRJ	Variable	2901552	Variable	2901552	Variable	2901552
B-FOC (ST®) connector, IP20	BFOC	Variable	2901552	Variable	2901552	Variable	2901552
Push/pull SCRJ, plastic	PPCPL	Variable	1402175	Variable	1402175	Variable	1402175
Push/pull SCRJ, metal	PPCME	Variable	1402175	Variable	1402175	Variable	1402175

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402175	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

Order No.	Length [m]
2313407	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**
Variable **2901552**	Variable **1402175**	Variable **1402175**
Variable **2901552**	Variable **1402175**	Variable **1402175**
Variable **2901552**	Variable **1402175**	Variable **1402175**
Variable **2901552**	Variable **1402175**	Variable **1402175**
Variable **1402175**	Variable **1402175**	
Variable **1402175**		Variable **1402175**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 180A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	275 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	Green
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	Black and orange with arrow labeling
Diameter	2.2 mm ±0.07 mm
General data	
Weight	51 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Universal PROFINET B HCS cable for free assembly, type PN-B-HCS-1018

- Universal installation cable for fixed installation indoors
- 2.2 mm single wires made from extremely hard-wearing polyvinyl chloride (PVC)
- Halogen-free, ozone and UV resistant
- PVC outer cable sheath
- PROFINET type B

Ethernet

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end OE	By the meter	2313766	Variable	2901556	Variable	2901556
FSMA connector, IP20 FSMA	Variable	2901556	Variable	2901556	Variable	2901556
SCRJ connectors, IP20 SCRJ	Variable	2901556	Variable	2901556	Variable	2901556
SC duplex connector, IP20 SCDUP	Variable	2901556	Variable	2901556	Variable	2901556
B-FOC (ST®) connector, IP20 BFOC	Variable	2901556	Variable	2901556	Variable	2901556
LC connector LC	Variable	2901556	Variable	2901556	Variable	2901556
Push/pull SCRJ, plastic PPCPL	Variable	1402190	Variable	1402190	Variable	1402190
Push/pull SCRJ, metal PPCME	Variable	1402190	Variable	1402190	Variable	1402190

Ordering example:

For an **HCS cable** with two **SCRJ plugs with IP20 protection** and **70 m in length**, the ordering data is as follows:

Order No.	Length [m]
1408466	/ 70

Length:	Min. 1 m Max. 2000 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
SCDUP	BFOC	LC	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**	**Order No.**	**Order No.**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **1402190**	Variable **1402190**	Variable **1402190**	Variable **1402190**	
Variable **1402190**	Variable **1402190**	Variable **1402190**		Variable **1402190**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	AT-V(ZN)YY 2K200/230 HCS
Fibers	HCS, 200/230 µm
Attenuation, typical	10 dB/km (at 660 nm), 8 dB/km (at 850 nm)
Outer sheath	
Material	PVC
Color	Green
Diameter	6.7 - 7.7 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PVC
Color	Black and orange with arrow labeling
Diameter	2.2 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	45 kg/km
Ambient temperature (operation)	-40 °C ... 90 °C
Ambient temperature (storage/transport)	-40 °C ... 90 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	-

PROFINET C HCS broadband cable (GI) for free assembly, type PN-C-HCS-GI-1005

- Highly flexible round cable for use in trailing cables or drag chains
- Rugged installation cable for indoor use
- Gradient index fiber for maximum power requirements in respect of transmission bandwidth
- Can be used in 10/100/1000 Mbps Ethernet systems
- 2.2 mm single wires made from polyvinyl chloride (PVC)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath
- Highly tear-resistant aramid strain relief elements
- PROFINET type C

Ethernet

PROFINET

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2313410	Variable	2901554	Variable	2901554
FSMA connector, IP20						
FSMA	Variable	2901554	Variable	2901554	Variable	2901554
SCRJ connectors, IP20						
SCRJ	Variable	2901554	Variable	2901554	Variable	2901554
SC duplex connector, IP20						
SCDUP	Variable	2901554	Variable	2901554	Variable	2901554
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901554	Variable	2901554	Variable	2901554
LC connector						
LC	Variable	2901554	Variable	2901554	Variable	2901554
Push/pull SCRJ, plastic						
PPCPL	Variable	1402189	Variable	1402189	Variable	1402189
Push/pull SCRJ, metal						
PPCME	Variable	1402189	Variable	1402189	Variable	1402189

Ordering example for configured cable:

For an **HCS cable 15 m in length** equipped with an **SCRJ connector** at one end and an **SCRJ push/pull plastic connector** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
1402189	SCRJ	PPCPL	15

Length:	Min. 1 m Max. 2000 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

Ordering example for cable sold by the meter:

For an **HCS cable 70 m in length**, the order data is as follows:

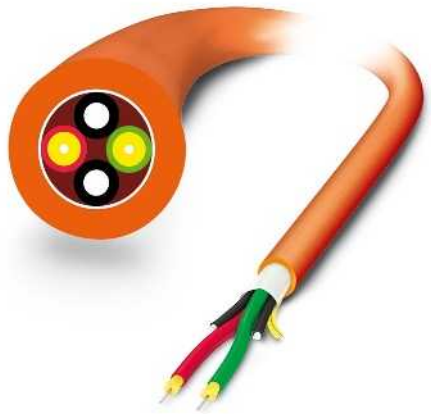
Order No.	Length [m]
2313410	70

Length:	Min. 1 m Max. 2000 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
SCDUP	BFOC	LC	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**	**Order No.**	**Order No.**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **1402189**	Variable **1402189**	Variable **1402189**	Variable **1402189**	
Variable **1402189**	Variable **1402189**	Variable **1402189**		Variable **1402189**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V(ZN)12Y(ZN)11Y 2GK200/230 GI-HCS
Fibers	HCS gradient index, 200/230 µm
Attenuation, typical	18 dB/km (at 660 nm), 12 dB/km (at 850 nm)
Outer sheath	
Material	PUR
Color	Green
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PVC
Color	Black and orange with arrow labeling
Diameter	2.2 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	52 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Rugged HCS cable for free assembly, type HCS-RUGGED-1014



- Rugged installation cable for indoor use
- Highly tear-resistant aramid strain relief elements
- 2.9 mm single wires made from highly flexible FRNC material
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2799885	Variable	2901555	Variable	2901555
FSMA connector, IP20						
FSMA	Variable	2901555	Variable	2901555	Variable	2901555
SCRJ connectors, IP20						
SCRJ	Variable	2901555	Variable	2901555	Variable	2901555
SC duplex connector, IP20						
SCDUP	Variable	2901555	Variable	2901555	Variable	2901555
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901555	Variable	2901555	Variable	2901555
LC connector						
LC	Variable	2901555	Variable	2901555	Variable	2901555
Push/pull SCRJ, plastic						
PPCPL	Variable	1402191	Variable	1402191	Variable	1402191
Push/pull SCRJ, metal						
PPCME	Variable	1402191	Variable	1402191	Variable	1402191
SCRJ connector, IP67						
IP67	Variable	1402191	Variable	1402191	Variable	1402191

Ordering example for configured cable:

For an **HCS cable 15 m in length** equipped with an **SCRJ connector** at one end and an **SCRJ push/pull plastic connector** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
1402191	SCRJ	PPCPL	15

Length:	Min. 1 m Max. 2000 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

Ordering example for cable sold by the meter:

For an **HCS cable 70 m in length**, the order data is as follows:

Order No.	Length [m]
2799885	70

Length:	Min. 1 m Max. 2000 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector	Push/pull SCRJ, plastic	Push/pull SCRJ, metal	SCRJ connector, IP67
SCDUP	BFOC	LC	PPCPL	PPCME	IP67
Ordering data	Ordering data	Ordering data	Ordering data	Ordering data	Ordering data
Order No.	Order No.	Order No.	Order No.	Order No.	Order No.
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 1402191	Variable 1402191	Variable 1402191	Variable 1402191		
Variable 1402191	Variable 1402191	Variable 1402191		Variable 1402191	
Variable 1402191	Variable 1402191	Variable 1402191			Variable 1402191

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	I-VH11Y 2K200/230 HCS
Fibers	HCS, 200/230 µm
Attenuation, typical	10 dB/km (at 660 nm), 8 dB/km (at 850 nm)
Outer sheath	
Material	PUR
Color	orange
Diameter	7.5 - 8.5 mm
Single wire	
Material	FRNC material
Color	Red/green
Diameter	2.9 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	54 kg/km
Ambient temperature (operation)	-40 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Ambient temperature (installation)	-20 °C ... 60 °C

Outdoor cables for free assembly, type HCSO-1015

- Rugged round cable for laying outdoors
- Longitudinally water-tight
- Integrated vapor barrier and rodent-proof scrim
- 2.9 mm single wires made from highly flexible FRNC material
- Ozone and UV resistant
- Extremely rugged polyethylene outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
	Order No.		Order No.		Order No.	
free end						
OE	By the meter	2799445	Variable	2901557	Variable	2901557
FSMA connector, IP20						
FSMA	Variable	2901557	Variable	2901557	Variable	2901557
SCRJ connectors, IP20						
SCRJ	Variable	2901557	Variable	2901557	Variable	2901557
SC duplex connector, IP20						
SCDUP	Variable	2901557	Variable	2901557	Variable	2901557
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901557	Variable	2901557	Variable	2901557
LC connector						
LC	Variable	2901557	Variable	2901557	Variable	2901557

Ordering example for configured cable:

For an **HCS cable 15 m in length** equipped with an **SCRJ connector** at one end and a **B-FOC(ST®) connector, IP20** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
2901557	SCRJ	BFOC	15

Length:	Min. 1 m Max. 1000 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 1000 m

Ordering example for cable sold by the meter:

For an **HCS cable 70 m in length**, the order data is as follows:

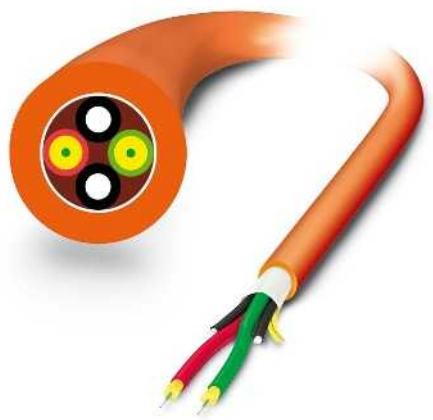
Order No.	Length [m]
2799445	70

Length:	Min. 1 m Max. 1000 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 1000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector
SCDUP	BFOC	LC
Ordering data	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	AT-VQHB2Y 2K200/230 10A17+8B20
Fibers	HCS, 200/230 µm
Attenuation, typical	10 dB/km (at 660 nm), 8 dB/km (at 850 nm)
Outer sheath	
Material	PE
Color	black
Diameter	10 - 11 mm
Strain relief elements	Non-metallic, aramid fiber
Rodent protection	Glass fibers
Lengthwise waterproofing	IEC 60794-1-2
Single wire	
Material	FRNC material
Color	Red/green
Diameter	2.9 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	97 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-25 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Multi-mode fiberglass cables for free assembly, type GDM-RUGGED-1016



- Rugged installation cable for indoor use
- Highly tear-resistant aramid strain relief elements
- 2.9 mm single wires made from highly flexible FRNC material
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2799322	Variable	2901558	Variable	2901558
FSMA connector, IP20						
FSMA	Variable	2901558	Variable	2901558	Variable	2901558
SCRJ connectors, IP20						
SCRJ	Variable	2901558	Variable	2901558	Variable	2901558
SC duplex connector, IP20						
SCDUP	Variable	2901558	Variable	2901558	Variable	2901558
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901558	Variable	2901558	Variable	2901558
LC connector						
LC	Variable	2901558	Variable	2901558	Variable	2901558
Push/pull SCRJ, plastic						
PPCPL	Variable	1402193	Variable	1402193	Variable	1402193
Push/pull SCRJ, metal						
PPCME	Variable	1402193	Variable	1402193	Variable	1402193
SCRJ connector, IP67						
IP67	Variable	1402193	Variable	1402193	Variable	1402193

Ordering example for configured cable:

For a **glass fiber cable 15 m in length** equipped with an SCRJ connector at one end and an **SCRJ push/pull plastic connector** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
1402193	SCRJ	PPCPL	15

Length	Min. 1 m Max. 1000 m
Increment:	1 m 1 m ... 1000 m

Ordering example for cable sold by the meter:

For a **glass fiber cable 70 m in length**, the order data is as follows:

Order No.	Length [m]
2799322	70

Length	Min. 1 m Max. 1000 m/cable drum
Increment:	1 m 1 m ... 1000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector	Push/pull SCRJ, plastic	Push/pull SCRJ, metal	SCRJ connector, IP67
SCDUP	BFOC	LC	PPCPL	PPCME	IP67
Ordering data	Ordering data	Ordering data	Ordering data	Ordering data	Ordering data
Order No.	Order No.	Order No.	Order No.	Order No.	Order No.
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 1402193	Variable 1402193	Variable 1402193	Variable 1402193		
Variable 1402193	Variable 1402193	Variable 1402193		Variable 1402193	
Variable 1402193	Variable 1402193	Variable 1402193			Variable 1402193

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	I-V(ZN)H11Y 2G50/125 2,5B600+0,7F1200
Fibers	Fiberglass, 50/125 µm
Attenuation, typical	2.5 dB/km (at 850 nm), 0.7 dB/km (at 1300 nm)
Outer sheath	
Material	PUR
Color	orange
Diameter	7.5 - 8.5 mm
Single wire	
Material	FRNC material
Color	Red/green
Diameter	2.9 mm ±0.1 mm
General data	
Weight	50 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-25 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Outdoor multi-mode fiberglass cables for free assembly, type GDO-1017

- Rugged round cable for laying outdoors
- Longitudinally water-tight
- Integrated vapor barrier and rodent-proof scrim
- 2.9 mm single wires made from highly flexible FRNC material
- Ozone and UV resistant
- Extremely rugged polyethylene outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
	Order No.		Order No.		Order No.	
free end						
OE	By the meter	2799432	Variable	2901559	Variable	2901559
FSMA connector, IP20						
FSMA	Variable	2901559	Variable	2901559	Variable	2901559
SCRJ connectors, IP20						
SCRJ	Variable	2901559	Variable	2901559	Variable	2901559
SC duplex connector, IP20						
SCDUP	Variable	2901559	Variable	2901559	Variable	2901559
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901559	Variable	2901559	Variable	2901559
LC connector						
LC	Variable	2901559	Variable	2901559	Variable	2901559

Ordering example for configured cable:

For a **glass fiber cable 15 m in length** equipped with an **SCRJ connector** at one end and a **B-FOC(ST®) connector, IP20** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
2901559	/ SCRJ	/ BFOC	/ 15

Length:	Min. 1 m Max. 1000 m
Increment:	1 m 1 m ... 1000 m

Ordering example for cable sold by the meter:

For a **glass fiber cable 70 m in length**, the order data is as follows:

Order No.	Length [m]
2799432	/ 70

Length:	Min. 1 m Max. 1000 m/cable drum
Increment:	1 m 1 m ... 1000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector
SCDUP	BFOC	LC
Ordering data	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	AT-VQH(BN)2Y 2G50/125 2,5B600+0,7F1200
Fibers	Fiberglass, 50/125 µm
Attenuation, typical	2.5 dB/km (at 850 nm), 0.7 dB/km (at 1300 nm)
Outer sheath	
Material	PE
Color	black
Diameter	10 - 11 mm
Strain relief elements	Non-metallic, aramid fiber
Rodent protection	Glass fibers
Lengthwise waterproofing	IEC 60794-1-2
Single wire	
Material	FRNC material
Color	Red/green
Diameter	2.9 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	97 kg/km
Ambient temperature (operation)	-25 °C ... 70 °C
Ambient temperature (storage/transport)	-30 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Fiber optics patch cables

For fast integration of fiber optic devices into existing fiber optic networks, it is best to use preassembled patch cables. Patch cables can be ordered in lengths of one, two, and five meters for the following connector formats: SCRJ, SC duplex, LC, and B-FOC (ST®). Both single- and multi-mode fiberglass options are available.

Developed specifically for industrial applications, the preassembled patch cables feature a rugged design. The strong outer cable sheath and connector transitions with bending protection sleeve mean that they can be safely used inside control cabinets.

The extremely rugged patch cables are suitable for all fiber optic devices with an optical interface that supports single- and/or multi-mode fiberglass.

Connectors:
– LC
– SC duplex
– SCRJ
– B-FOC (ST®)

Fixed lengths:
– 1 m
– 2 m
– 5 m

Fiber types:
– Multi-mode fiberglass (MM)
– Single-mode fiberglass (SM)

Sheath colors:
– Multi-mode: orange
– Single mode: yellow

Technical data:
– Halogen-free
– Flame-retardant
– No corrosive or toxic fumes
– External dimensions: 2.8 mm x 5.7 mm

LC connector

Technical data

Cable, properties	
Single wire diameter	2.8 mm
Outer sheath, material	FRNC
External sheath, strain relief elements	Non-metallic, aramid fiber
Lateral pressure, long-term	60 N/cm
Tensile strength short-term/long-term	600 N
Halogen-free	According to IEC 60754-2
General data	
Ambient temperature (storage/transport)	-25 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Ambient temperature (operation)	-5 °C ... 70 °C

Ordering data

Description	Length of cable	Type	Order No.	Pcs. / Pkt.
FO patch cable with **multi-mode fiberglass (OM2)** - **LC connector** to LC, SC duplex, B-FOC or SCRJ connector				
	1 m	**FL MM PATCH 1,0 LC-LC**	**2989158**	1
	2 m	**FL MM PATCH 2,0 LC-LC**	**2989255**	1
	5 m	**FL MM PATCH 5,0 LC-LC**	**2901799**	1
FO patch cable with **multi-mode fiberglass (OM2)** - **SC duplex connector** to SC duplex, B-FOC or SCRJ connector				
	1 m			
	2 m			
	5 m			
FO patch cable with **multi-mode fiberglass (OM2)** - **B-FOC connector** to B-FOC or SCRJ connector				
	1 m			
	2 m			
	5 m			
FO patch cable with **multi-mode fiberglass (OM2)** - **SCRJ connector** to SCRJ connector				
	1 m			
	2 m			
	5 m			
FO patch cable with **single-mode fiberglass (OS1)** - **LC connector** to LC, SC duplex or B-FOC connector				
	1 m	**FL SM PATCH 1,0 LC-LC**	**2989187**	1
	2 m	**FL SM PATCH 2,0 LC-LC**	**2989284**	1
	5 m	**FL SM PATCH 5,0 LC-LC**	**2901826**	1
FO patch cable with **single-mode fiberglass (OS1)** - **SC duplex connector** to SC duplex or B-FOC connector				
	1 m			
	2 m			
	5 m			
FO patch cable with **single-mode fiberglass (OS1)** - **B-FOC connector** to B-FOC connector				
	1 m			
	2 m			
	5 m			

SC duplex connector

B-FOC connector

SCRJ connector

Technical data

2.8 mm	
FRNC	
Non-metallic, aramid fiber	
60 N/cm	
600 N	
According to IEC 60754-2	
-25 °C ... 70 °C	
-5 °C ... 50 °C	
-5 °C ... 70 °C	

Technical data

2.8 mm	
FRNC	
Non-metallic, aramid fiber	
60 N/cm	
600 N	
According to IEC 60754-2	
-25 °C ... 70 °C	
-5 °C ... 50 °C	
-5 °C ... 70 °C	

Technical data

2.8 mm	
FRNC	
Non-metallic, aramid fiber	
60 N/cm	
600 N	
According to IEC 60754-2	
-25 °C ... 70 °C	
-5 °C ... 50 °C	
-5 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MM PATCH 1,0 LC-SC	**2989161**	1
FL MM PATCH 2,0 LC-SC	**2989268**	1
FL MM PATCH 5,0 LC-SC	**2901800**	1
FL MM PATCH 1,0 SC-SC	**2901805**	1
FL MM PATCH 2,0 SC-SC	**2901807**	1
FL MM PATCH 5,0 SC-SC	**2901808**	1
FL SM PATCH 1,0 LC-SC	**2989190**	1
FL SM PATCH 2,0 LC-SC	**2989297**	1
FL SM PATCH 5,0 LC-SC	**2901827**	1
FL SM PATCH 1,0 SC-SC	**2901829**	1
FL SM PATCH 2,0 SC-SC	**2901830**	1
FL SM PATCH 5,0 SC-SC	**2901831**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MM PATCH 1,0 LC-ST	**2989174**	1
FL MM PATCH 2,0 LC-ST	**2989271**	1
FL MM PATCH 5,0 LC-ST	**2901801**	1
FL MM PATCH 1,0 SC-ST	**2901809**	1
FL MM PATCH 2,0 SC-ST	**2901810**	1
FL MM PATCH 5,0 SC-ST	**2901811**	1
FL MM PATCH 1,0 ST-ST	**2901815**	1
FL MM PATCH 2,0 ST-ST	**2901816**	1
FL MM PATCH 5,0 ST-ST	**2901817**	1
FL SM PATCH 1,0 LC-ST	**2989242**	1
FL SM PATCH 2,0 LC-ST	**2989349**	1
FL SM PATCH 5,0 LC-ST	**2901828**	1
FL SM PATCH 1,0 SC-ST	**2901832**	1
FL SM PATCH 2,0 SC-ST	**2901833**	1
FL SM PATCH 5,0 SC-ST	**2901834**	1
FL SM PATCH 1,0 ST-ST	**2901836**	1
FL SM PATCH 2,0 ST-ST	**2901837**	1
FL SM PATCH 5,0 ST-ST	**2901838**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MM PATCH 1,0 LC-SCRJ	**2901802**	1
FL MM PATCH 2,0 LC-SCRJ	**2901803**	1
FL MM PATCH 5,0 LC-SCRJ	**2901804**	1
FL MM PATCH 1,0 SC-SCRJ	**2901812**	1
FL MM PATCH 2,0 SC-SCRJ	**2901813**	1
FL MM PATCH 5,0 SC-SCRJ	**2901814**	1
FL MM PATCH 1,0 ST-SCRJ	**2901820**	1
FL MM PATCH 2,0 ST-SCRJ	**2901821**	1
FL MM PATCH 5,0 ST-SCRJ	**2901822**	1
FL MM PATCH 1,0 SCRJ-SCRJ	**2901823**	1
FL MM PATCH 2,0 SCRJ-SCRJ	**2901824**	1
FL MM PATCH 5,0 SCRJ-SCRJ	**2901825**	1

Quick mounting connectors for polymer fiber cable

These connectors are easy to assemble and allow fast and simple self-assembly on site. They correspond to the international F-SMA and SCRJ standards, although their quick mounting mechanism makes them stand out from conventional connectors. The stripped fiber is simply pushed into the connector and tightened with the knurled screw. To ensure optimum performance, the end face is then polished. The tools required are also available as a complete DIY case (PSM-POF-KONFTOOL).

Quick mounting connector for HCS (PCF) cables

The PSM-SET-...HCS connector sets for the 200/230 µm fibers make it possible to enjoy the benefits of self-assembly for the kinds of distances that could otherwise only be achieved by using cables made purely from fiberglass. The F-SMA, B-FOC (ST®), SCRJ, and SC duplex connector types are internationally standardized, although their quick mounting mechanism makes them stand out from conventional connectors. This new patented clamping device eliminates all time-consuming tasks such as crimping, sticking, and polishing operations. All that is required is to strip the fibers, slide and screw on the connector, and score and break off the protruding fibers. All the tools required, including the fiber scoring tool, are included in the PSM-HCS-KONFTOOL... tool set. Other connector-specific fiber cleaving tools can be added on request.

Connectors with a diameter of 2.9 mm must be used for our standard HCS fibers. In the case of our PROFINET-compliant fibers, connectors with a diameter of 2.2 mm should be used. Please refer to the following table and to the data sheets for our FO cables.

Quick mounting connector for polymer and HCS fibers

Technical data

	Polymer fiber	HCS fiber
Insertion attenuation		
- F-SMA connector	< 1.5 dB	< 2 dB
- B-FOC (ST®)	-	< 2 dB
- SCRJ connector	< 1.5 dB	< 2 dB
- SC duplex connector	-	< 2 dB

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Connector set for polymer fibers (diameter of the individual elements: 2.2 mm), for self-assembly, with bend protection			
- F-SMA set, 4 connectors	**PSM-SET-FSMA/4-KT**	**2799720**	1
- SCRJ set, 2 duplex connectors	**PSM-SET-SCRJ-DUP/2-POF**	**2708656**	1
Connector set for HCS fibers (diameter of the individual elements: 2.9 mm), for self-assembly, with bend protection			
- F-SMA set, 4 connectors	**PSM-SET-FSMA/4-HCS**	**2799487**	1
- B-FOC (ST®) set, 4 connectors	**PSM-SET-B-FOC/4-HCS**	**2708481**	1
- SCRJ set, 2 duplex connectors	**PSM-SET-SCRJ-DUP/2-HCS**	**2313070**	1
Connector set for PROFINET HCS fibers (diameter of the individual elements: 2.2 mm), for self-assembly, with bend protection			
- B-FOC (ST®) set, 4 connectors	**PSM-SET-B-FOC/4-HCS/PN**	**2313782**	1
- SCRJ set, 2 duplex connectors	**PSM-SET-SCRJ-DUP/2-HCS/PN**	**2313546**	1
- SC duplex set, 2 duplex connectors	**PSM-SET-SC-DUPLEX/2-HCS/PN**	**2313779**	1

Accessories

Polymer fiber DIY case, consisting of: stripping knife, stripping pliers, polishing wheel for F-SMA and SCRJ quick mounting connectors, polishing pad and emery paper	**PSM-POF-KONFTOOL**	**2744131**	1
Polymer fiber polishing set for quick mounting connectors, comprising polishing pads and polishing disks			
- For F-SMA connectors	**PSM-SET-FSMA-POLISH**	**2799348**	1
- For SCRJ connectors	**VS-SCRJ-POF-POLISH**	**1656673**	1
HCS DIY case for F-SMA quick mounting connectors, comprising stripping blade, stripping pliers, aramid yarn scissors, fiber stripper, fiber cleaving tool, and microscope			
- For F-SMA connectors	**PSM-HCS-KONFTOOL**	**2799526**	1
- For B-FOC (ST®) connectors	**PSM-HCS-KONFTOOL/B-FOC**	**2708465**	1
- For SCRJ/SC duplex connectors	**PSM-HCS-KONFTOOL/SC-RJ**	**2708876**	1

Permissible combinations of fiber optic cables and connector sets

Fiber optic cable		Connector set	
2799885	**PSM-LWL-HCS-RUGGED-200/230**	**2799487**	**PSM-SET-FSMA/4-HCS**
2799445	**PSM-LWL-HCSO-200/230**	**2708481**	**PSM-SET-B-FOC/4-HCS**
		2313070	**PSM-SET-SCRJ-DUP/2-HCS**
2313410	**FL FOC PN-C-HCS-GI-200/230**	**2313779**	**PSM-SET-SC-DUPLEX/2-HCS/PN**
2313766	**FL FOC PN-B-HCS-200/230**	**2313782**	**PSM-SET-B-FOC/4-HCS/PN**
		2313546	**PSM-SET-SCRJ-DUP/2-HCS/PN**

Assembly case for quick mounting connector

The DIY cases for polymer and HCS cables are designed for practical on-site assembly. These cases contain the complete tool range for assembly of the appropriate quick mounting connectors.

Polymer fiber cables are assembled quickly and easily using the PSM-POF-KONFTOOL DIY case. The F-SMA or SCRJ connectors are used in this context.

Various PSM-HCS-KONFTOOL... tool sets are available for fitting connectors to the powerful HCS fibers, as the HCS fibers can be connected to F-SMA, B-FOC (ST®), SCRJ, and SC duplex connectors, depending on the application and device concerned. An individual fiber cleaving tool (cleave tool) is required for this due to the different connector receptacles.

All fiber cleaving tools can also be ordered separately to allow the existing DIY cases to be upgraded if required. Similarly, all the tools in the DIY case can be ordered individually as replacement parts.

We will also provide you with our tool sets temporarily for a low rental rate on request. Please contact us for an individual quote.

Assembly case for quick mounting connector

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Polymer fiber DIY case, consisting of: stripping knife, stripping pliers, polishing wheel for F-SMA and SCRJ quick mounting connectors, polishing pad and emery paper	**PSM-HCS-KONFTOOL/B-FOC**	**2708465**	1
HCS DIY case for F-SMA quick mounting connectors, comprising stripping blade, stripping pliers, aramid yarn scissors, fiber stripper, fiber cleaving tool, and microscope	**PSM-HCS-KONFTOOL**	**2799526**	1
HCS (GI) DIY case for B-FOC (ST®) quick mounting connectors, stripping blade, stripping pliers, aramid yarn scissors, fiber stripper, fiber cleaving tool, and microscope	**PSM-HCS-KONFTOOL/B-FOC**	**2708465**	1
HCS (GI) DIY case for SCRJ and SC duplex quick mounting connectors, stripping blade, stripping pliers, aramid yarn scissors, fiber stripper, fiber cleaving tool, and microscope	**PSM-HCS-KONFTOOL/SC-RJ**	**2708876**	1

Accessories

Fiber cleaning tool for HCS fiber, pin arrangement F-SMA	**PSM-HCS-CLEAVETOOL**	**2744995**	1
Fiber cleaving tool for HCS (GI) fiber, pin arrangement B-FOC (ST®)	**PSM-HCS-CLEAVETOOL/B-FOC**	**2708478**	1
Fiber cleaving tool for HCS (GI) fiber, pin arrangement SCRJ/SC duplex	**PSM-HCS-CLEAVETOOL/SCRJ**	**2313122**	1

Measurement technology for fiber optics

The PSM-FO-POWERMETER fiber optic measuring case is used for carrying out optical power measurements. It provides a straightforward method for determining path attenuations and the remaining system reserves in fiber optic transmission systems with 660 nm and 850 nm.

The case contains a power meter and all the necessary reference cables and couplings for checking polymer, HCS, and fiberglass paths with an F-SMA or B-FOC (ST®) connection. An optional set can be ordered for terminal devices with an SCRJ connection.

– The power meter can be switched over between the following wavelengths: 660 nm, 780 nm, and 850 nm
– Suitable for terminal devices with an F-SMA, B-FOC (ST®), and SCRJ connection
– Reference cables with polymer, HCS, and fiberglass

Universal fiber optics measuring case

Technical data

Measuring instrument	
Receiver	Large-format silicon element
Wavelength	660 nm, 780 nm, 850 nm
Measuring range	-70 dB ... 6 dB
Accuracy	± 0.25 dB
Resolution	0.01 dB
Ambient temperature range	0 °C ... 45 °C
Relative humidity	max. 95%
Weight	180 g
Dimensions L / W / H	115 mm / 70 mm / 25 mm
Reference fibers, fiber optic measuring case	
Insertion attenuation in accordance with IEC874-1 method 7	
Polymer fiber 980/1000 µm F-SMA	1.5 dB ... 2 dB
HCS fiber 200/230 µm F-SMA	1.5 dB ... 2 dB
HCS fiber 200/230 µm B-FOC (ST®)	1.5 dB ... 2 dB
Fiberglass 50/125 µm B-FOC (ST®)	1.5 dB ... 2 dB
Reference fibers, Powermeter supplementary set	
Insertion attenuation in accordance with IEC874-1 method 7	
Polymer fiber 980/1000 µm SC/F-SMA	1.5 dB ... 2 dB
HCS GI fiber 200/230 µm SC/BFOC (ST®)	1.5 dB ... 2 dB

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fiber optic measuring case, comprising an optical power meter, F-SMA and B-FOC (ST®) coupling, reference fibers, and operating instructions	**PSM-FO-POWERMETER**	**2799539**	1
Powermeter supplementary set for devices with SCRJ interface, comprising one-meter polymer reference fiber (SC Simplex connector to F-SMA connector), one-meter HCS GI reference fiber (SC Simplex connector to B-FOC (ST®) connector), and SCRJ coupling	**PSM-FO-POWERMETER SCRJ-SET**	**2901560**	1

Couplings for fiber optics

Couplings are used to connect two FO connectors with the same pin arrangement. Couplings are used when a cable needs to be extended or when creating a non-permanent panel feed-through. However, the extra transitional attenuation (< 2 dB for all couplings) must be taken into consideration when planning the path resources. The sets include two F-SMA couplings or two B-FOC (ST®) couplings for connecting duplex cables. The SCRJ duplex, SC duplex, and LC couplings are supplied separately.

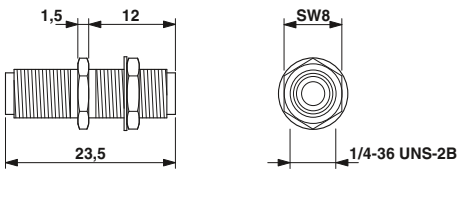
Notes:

Key:
B-FOC ≙ ST® (registered trademark of AT&T)

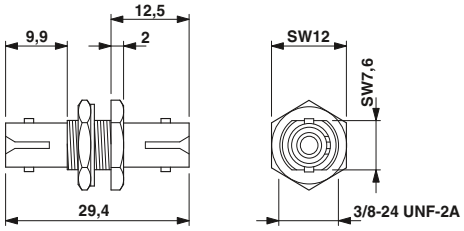
Couplings for connecting FO cables

Ordering data

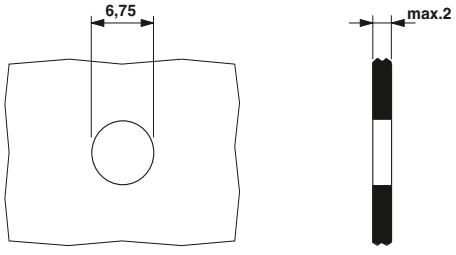
Description	Type	Order No.	Pcs. / Pkt.
Coupling ; set, consisting of:			
- 2x F-SMA/F-SMA	**PSM-SET-FSMA-LINK/2**	**2799416**	1
- 2x B-FOC (ST®)/B-FOC (ST®)	**PSM-SET-BFOC-LINK/2**	**2799429**	1
- 1x SCRJ/SCRJ (duplex)	**VS-SCRJ-GOF-BU/BU**	**1652978**	1
- 1 x LC/LC (duplex, multi-mode fiber)	**FL MM PATCH COUPLER LC-LC**	**2700312**	1
- 1 x LC/LC (duplex, single-mode fiber)	**FL SM PATCH COUPLER LC-LC**	**2700313**	1
- 1x SC duplex/SC duplex	**FL COUPLER SC-DUPLEX**	**2901788**	1



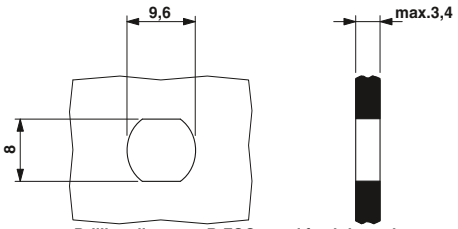
Dimensional drawing F-SMA coupling



Dimensional drawing B-FOC coupling



Drilling diagram F-SMA panel feed-through



Drilling diagranm B-FOC panel feed-through

Media converters for converting 10/100 BASE-T(X) Ethernet to fiber optics

Devices with 1300 nm wavelength

The FL MC EF 1300… media converters convert the Ethernet interface tofiber optics. This provides maximum immunity to interference and maximum transmission ranges in industrial Ethernet applications.

Ethernet interface:

– RJ45 socket
– 10/100 Mbps
– Auto negotiation
– Auto-MDI/MDI-X
– Link fault pass through
– Signal LEDs for activity, link status, 10/100 Mbps

Fiber optic interface:

– B-FOC (ST®) or SC-DUPLEX
– Multi-mode or single-mode cable
– Signal LEDs for link status and far end fault signaling

Features:

– Backplane bus contact (DIN rail connector), enabling alternative or redundant 24 V power supply
– Link fault pass through (LFP) and far end fault (FEF) functions for easy connection monitoring. The connection status between the devices is monitored and signaled.

Devices with WDM technology

The FL MC EF WDM... media converters enable full duplex communication with a single glass fiber via WDM technology (Wavelength Division Multiplex).

Features:

– 1310 nm and 1550 nm wavelengths for transmitting and receiving
– Single-mode fiberglass
– SC simplex connection

Application:

– Single-fiber transmission of optical signals in rotating applications with optical slip rings, e.g., wind power or automotive industry
– Doubling of the bandwidth or establishment of separate networks in existing wiring (separate outgoing/return line)

Notes:

1) EMC: Class A product, see page 553

Ethernet

Single-fiber transmission WDM technology

Ex:

Technical data

Supply		
Supply voltage		18 V DC ... 30 V DC (screw connection)
Supply voltage		18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		≤ 100 mA (24 V DC)
FO interface		
Wavelength		1310 / 1550 nm
Transmission length incl. 3 dB system reserve		38 km (with F-E 9/125 0.36 dB/km) 34 km (with F-E 9/125 0.4 dB/km) 28 km (with F-E 9/125 0.5 dB/km)
Signal LEDs		Far end fault (red LED), link status (yellow LED)
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps
Auto-negotiation modes		Auto
Transmission length		100 m (twisted pair, shielded)
Link through		Link fault pass through
MDI-/MDI-X switchover		Auto-MDI(X)
Signal LEDs		Activity, link status, 10/100 Mbps
General data		
Ambient temperature (operation)		-40 °C ... 65 °C
Electrical isolation		(VCC // FE // Ethernet)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm
Conformance / approvals		
ATEX		II 3 G Ex nA IIC T4 Gc X

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FO converter, for converting 10/100 BASE-TX to a single-mode optical fiber, WDM technology			
WDM set with devices A and B, SC simplex connection	**FL MC EF WDM-SET SC**	**2902660**	1
WDM device A, SC simplex connection	**FL MC EF WDM-A SC[1])**	**2902658**	1
WDM device B, SC simplex connection	**FL MC EF WDM-B SC[1])**	**2902659**	1
FO converter, for converting 10/100 BASE-TX to: Multi-mode fiberglass (1300 nm), SC duplex connection			
FO converter, for converting 10/100 BASE-TX to: Single-mode fiberglass (1300 nm), SC duplex connection			
FO converter, for converting 10/100 BASE-TX to: Multi-mode fiberglass (1300 nm), B-FOC (ST®) connection			

Accessories

DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
Fiberglass single mode patch cable	**FL SM PATCH 2,0 SC-SC**	**2901830**	1
PROFINET HCS GI cable, duplex, 200/230 µm, for indoor installation			
Connector set for PROFINET HCS fibers (diameter of the individual elements: 2.2 mm), for self-assembly, with bend protection			

Ethernet

PROFINET

Modbus

Multi-mode fiberglass
SC duplex connection

Ex:

Technical data

	18 V DC ... 30 V DC (screw connection) 18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
	≤ 100 mA (24 V DC)
	1310 nm 6.4 km (with F-G 50/125 0,7 dB/km F 1000) 2.8 km (with F-G 50/125 1,6 dB/km F 800) 10 km (with F-G 62.5/125 0,7 dB/km F 1000) 3 km (with F-G 62.5/125 2.6 dB/km F 600) 2 km (with 2GK200/230 GI-HCS) Far end fault (red LED), link status (yellow LED)
	RJ45 socket, shielded 10/100 Mbps Auto 100 m (twisted pair, shielded) Link fault pass through Auto-MDI(X) Activity, link status, 10/100 Mbps
	-40 °C ... 65 °C (VCC // FE // Ethernet) 1.5 kV_{rms} (50 Hz, 1 min.) 22.5 mm / 99 mm / 114.5 mm
	II 3 G Ex nA IIC T4 Gc X II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MC EF 1300 MM SC[1])	**2902853**	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
FL FOC PN-C-HCS-GI-200/230	**2313410**	1
PSM-SET-SC-DUPLEX/2-HCS/PN	**2313779**	1

Ethernet

PROFINET

Modbus

Single-mode fiberglass
SC duplex connection

Ex:

Technical data

	18 V DC ... 30 V DC (screw connection) 18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
	≤ 100 mA (24 V DC)
	1310 nm 36 km (with F-E 9/125 0.36 dB/km) 32 km (with F-E 9/125 0.4 dB/km) 26 km (with F-E 9/125 0.5 dB/km) Far end fault (red LED), link status (yellow LED)
	RJ45 socket, shielded 10/100 Mbps Auto 100 m (twisted pair, shielded) Link fault pass through Auto-MDI(X) Activity, link status, 10/100 Mbps
	-40 °C ... 65 °C (VCC // FE // Ethernet) 1.5 kV_{rms} (50 Hz, 1 min.) 22.5 mm / 99 mm / 114.5 mm
	II 3 G Ex nA IIC T4 Gc X

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MC EF 1300 SM SC[1])	**2902856**	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
FL SM PATCH 2,0 SC-SC	**2901830**	1

Ethernet

PROFINET

Modbus

Multi-mode fiberglass
B-FOC (ST®) connection

Ex:

Technical data

	18 V DC ... 30 V DC (screw connection) 18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
	≤ 100 mA (24 V DC)
	1310 nm 6.4 km (with F-G 50/125 0,7 dB/km F 1000) 2.8 km (with F-G 50/125 1,6 dB/km F 800) 10 km (with F-G 62.5/125 0,7 dB/km F 1000) 3 km (with F-G 62.5/125 2.6 dB/km F 600) 2 km (with 2GK200/230 GI-HCS) Far end fault (red LED), link status (yellow LED)
	RJ45 socket, shielded 10/100 Mbps Auto 100 m (twisted pair, shielded) Link fault pass through Auto-MDI(X) Activity, link status, 10/100 Mbps
	-40 °C ... 65 °C (VCC // FE // Ethernet) 1.5 kV_{rms} (50 Hz, 1 min.) 22.5 mm / 99 mm / 114.5 mm
	II 3 G Ex nA IIC T4 Gc X II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MC EF 1300 MM ST[1])	**2902854**	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
FL FOC PN-C-HCS-GI-200/230	**2313410**	1
PSM-SET-B-FOC/4-HCS/PN	**2313782**	1

Media converters for converting 10/100 BASE-T(X) Ethernet to fiber optics

Devices with 660 nm wavelength

The FL MC 10/100BASE-T/FO 660 media converter converts the 10/100Base-T(X) Ethernet interface to fiber optics. This allows maximum immunity to interference and maximum transmission ranges in industrial Ethernet applications.

Integrated fiber optic diagnostics continuously signal the receiving capacity by means of an LED bar graph and two floating switching outputs.

Applications:

– Increased transmission range in industrial Ethernet applications
– Immunity to electromagnetic interference

Ethernet interface:

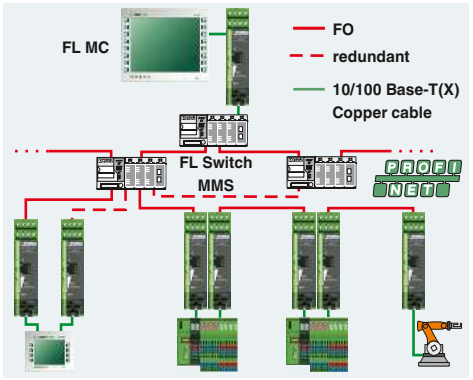
– RJ45 socket
– 10/100 Mbps
– Auto negotiation
– MDI/MDI-X switchover
– Signal LEDs for activity, link status, and 100 Mbps

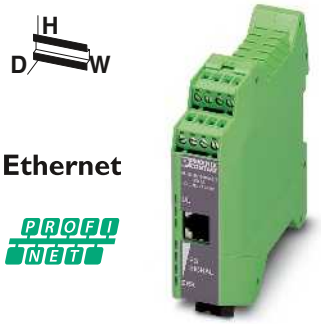
Fiber optic interface

– SCRJ connection
– Polymer and HCS (PCF) fibers
– Transmission distance of up to 300 m at 100 Mbps with HCS GI fibers
– 660 nm wavelength
– Signal LEDs for link status
– LED bar graph for signaling the receiving capacity

Features:

– Backplane bus contact (TBUS), enabling alternative or redundant 24 V power supply
– Link through function for easy connection monitoring. The availability of the connected cable connection and devices is monitored and indicated.
– Choice between local or transparent auto negotiation function for maximum transmission capacity





For polymer and HCS fibers

Technical data

Supply		
Supply voltage		18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		23 V DC ... 25 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		≤ 100 mA (24 V DC)
FO interface		
Wavelength		660 nm
Transmission length incl. 3 dB system reserve		70 m (polymer fiber with F-P 980/1000 230 dB/km at 10 Mbps) 300 m (HCS fiber with F-K 200/230 8 dB/km at 10 Mbps) 50 m (polymer fiber with F-P 980/1000 230 dB/km at 100 Mbps) 100 m (HCS fiber with F-K 200/230 8 dB/km at 100 Mbps) 300 m (HCS GI fiber with F-GK 200/230 at 100 Mbps) 400 m (HCS GI fiber with F-GK 200/230 at 10 Mbps)
Signal LEDs		Optical receiver power: very good (green), good (green), critical (yellow), fault (red)
Switching output		Two floating relay outputs
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps
Auto-negotiation modes		Optionally transparent via TP and FO (default) or locally on TP
Transmission length		100 m (twisted pair, shielded)
Link through		Link down is automatically forwarded to the second connection
MDI-/MDI-X switchover		Built-in switch for line (1:1) and crossover connection
Signal LEDs		Activity (yellow), link status (green, UL flashing), 100 Mbps (green)
General data		
Ambient temperature (operation)		-20 °C ... 60 °C
Electrical isolation		(VCC // Ethernet)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm
Conformance / approvals		
ATEX		II 3 G Ex nA nC IIC T4 Gc X
UL, USA / Canada		508 recognized

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FO converter, for converting 10/100Base-T to polymer or HCS fiber, (660 nm) SC-RJ connection	**FL MC 10/100BASE-T/FO-660**	**2708193**	1

Accessories

Polymer fiber cable POF, duplex, 980/1000 µm, heavy-duty PROFINET version, for permanent indoor installation			
- By the meter **w/o** plug	**FL FOC PN-B-980/1000**	**2313397**	1
- By the meter **w/o** plug	**FL FOC PN-C-FLEX-980/1000**	**2313407**	1
PROFINET HCS GI cable, duplex, 200/230 µm, for indoor installation			
- By the meter **w/o** plug	**FL FOC PN-C-HCS-GI-200/230**	**2313410**	1
	PSM-SET-SCRJ-DUP/2-POF	**2708656**	1
Plug set for polymer fibers, for self-assembly, with bend protection	**PSM-SET-SCRJ-DUP/2-HCS/PN**	**2313546**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1

N

Media converters for converting 10/100 BASE-T(X) Ethernet to fiber optics

Device with 1300 nm wavelength

The FL MC 2000E LC media converter is designed for use in energy technology. With its robust design, it can be used in environments subject to high levels of EMI around switchgear that have been designed according to the new IEC 61850 standard.

Features:

- 1300 nm wavelength
- Connection via multi-mode fiberglass cable with LC duplex plug
- Pass through mode with short latency for time-critical applications
- Link fault pass through (LFP) function for easy connection monitoring. The connection status between the devices is monitored and signaled.
- Wide operating temperature range (-40°C… 75°C)
- Redundant power supply with a wide range from 12 ... 57 V DC (24, 36, 48 V DC)
- Robust design for high EMC requirements
- Floating alarm contact for power supply monitoring and diagnostics and link monitoring

Notes:

An unmanaged switch which meets the same requirements that are required for switchgear and transformer substations in energy technology can be found on page 18

Ethernet

PROFINET

Modbus

Multi-mode fiberglass LC duplex connection

Technical data

Supply		
Supply voltage		12 V DC ... 57 V DC
Nominal current consumption		110 mA (24 V DC)
FO interface		
Wavelength		1300 nm
Transmission length incl. 3 dB system reserve		8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000) 3.3 km (fiberglass with F-G 62.5/125 2.6 dB/km F600) 9.6 km (fiberglass with F-G 50/125 0.7 dB/km F1200) 5.3 km (fiberglass with F-G 50/125 1.6 dB/km F800) 2 km (HCS GI fiber with F-GK 200/230)
Signal LEDs		LNK/ACT
Switching output		Floating relay output
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		100 Mbps
Auto-negotiation modes		Auto
Transmission length		100 m (twisted pair, shielded)
Link through		Link fault pass through
MDI-/MDI-X switchover		Auto-MDI(X)
Signal LEDs		LNK/ACT, 100
General data		
Ambient temperature (operation)		-40 °C ... 75 °C
Electrical isolation		(VCC // FE // Ethernet)
Test voltage		500 V DC
Dimensions	W / H / D	30 mm / 130 mm / 100 mm
Conformance / approvals		
ATEX		-
UL, USA / Canada		-

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FO converter, for converting 100 BASE-TX to:			
Multi-mode fiberglass (1300 nm), LC duplex connection	**FL MC 2000E LC**	**2891056**	1

Device servers for converting serial interfaces

The **FL COMSERVER...232/422/485** products are used to integrate serial V.24 (RS-232)/RS-422/RS-485 interfaces into existing Ethernet networks. This provides an easy way of implementing functions such as cable replacement, network integration or a Modbus gateway.

Cable replacement

Two devices in combination tunnel serial connections via Ethernet, using either the TCP or UDP protocol.

Network integration

You can integrate automation devices such as controllers or frequency inverters into a network using corresponding programming and diagnostics software. COM diversion software creates a virtual COM port on the PC and transmits the data to the FL COMSERVER.

Modbus gateway

The integrated Modbus gateway function provided in FL COMSERVER UNI converts serial Modbus ASCII or RTU data into Modbus TCP. Naturally, the conversion process also works in the opposite direction.

Features common to all devices:

- Serial interfaces, V.24 (RS-232), RS-422, RS-485
- 10/100 Base-T(X) interface
- Software for virtual COM ports supplied as standard
- Extended temperature range of -25°C to +60°C
- Redundant power supply and modular station structure with TBUS connectors
- 3-way electrical isolation VCC // V.24 (RS-232)/RS-422/RS-485 // network
- Integration into network management tools and visualization systems with the support of SNMP services
- LED diagnostic indicators
- Configuration via web-based management

FL COMSERVER UNI...

- Supports TCP, UDP, Modbus TCP/RTU/ASCII
- Can be used exactly as required on Modbus master or slave

FL COMSERVER BASIC...

- Best-value version
- Supports TCP and UDP

FL COMSERVER MPI-SET:

- For programming S7 controllers remotely over Ethernet
- Preconfigured FL COMSERVER BASIC...
- MPI adapter and V.24 (RS-232) cable supplied as standard

Notes:

1) EMC: Class A product, see page 553

Supply	
Supply voltage	
Supply voltage	
Nominal current consumption	
Serial port	
Interfaces	
Connection method	V.24 (RS-232) RS-422 RS-485
Data format/coding	
Data flow control/protocols	
Transmission speed	
Termination resistor	
Ethernet interface	
Connection method	
Transmission speed	
Transmission length	
Supported protocols	
Auxiliary protocols	
Functions	
Management	
General data	
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Electromagnetic compatibility	
Dimensions	W / H / D
Conformance / approvals	
UL, USA / Canada	

Description
FL COMSERVER...232/422/485, for converting serial interfaces to Ethernet. COM port redirector software and additional software supplied as standard
TCP, UDP, Modbus, PPP
FL COM SERVER, to convert a serial interface to Ethernet, incl. CD-ROM with drivers, additional software and user documentation (PDF)
TCP, UDP
MPI programming set, pre-configured, for coupling to the programming interface of a Siemens S7-300/400 controller, consisting of COM server, MPI adapter, and RS-232 cable

RS-232-D-SUB cable, length: 2 m
- 9-pos. socket on 9-pos. socket
- 9-pos. socket on 25-pos. socket
DIN rail connector
System power supply unit, primary-switched

Ethernet

Modbus

Universal device - Modbus gateway between RTU/ASCII and TCP

Ex: // Applied for: cUL / UL

Technical data	
24 V AC/DC ±20% (via plug-in COMBICON screw terminal block)	
24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	
100 mA (24 V DC)	
V.24 (RS-232), RS-422, RS-485	
D-SUB-9 plug	
Plug-in/screw connection via COMBICON	
Plug-in/screw connection via COMBICON	
UART/NRZ: 7/8 bit data, 1/2 bit stop, 1 bit parity	
Software handshake, Xon/Xoff, or hardware handshake RTS/CTS // 3964 R compatible, Modbus RTU/ASCII	
0.3 ; 0.6 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 38.4 ; 57.6 ; 115.2 ; 187.5 ; 230.4 kbps	
390 Ω / 180 Ω / 390 Ω (configurable)	
RJ45 socket, shielded	
10/100 Mbps, autonegotiation	
≤ 100 m (shielded twisted pair)	
TCP/IP, UDP, Modbus (TCP, RTU/ASCII), PPP	
ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP	
Web-based management, SNMP, emergency exit with Telnet and serial	
-25 °C ... 60 °C	
DIN EN 50178 (VCC // Ethernet // Serial)	
1.5 kV_{rms} (50 Hz, 1 min.)	
Conformance with EMC Directive 2004/108/EC	
22.5 mm / 99 mm / 116 mm	
508 listed	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL COMSERVER UNI 232/422/485[1])	**2313452**	1

Accessories

PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA 9 SUB 25/BB/2METER	**2761059**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Ethernet

Basic version for redirector operation - TCP and UDP

Ex: // Applied for: cUL / UL

Technical data	
24 V AC/DC ±20% (via plug-in COMBICON screw terminal block)	
24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	
100 mA (24 V DC)	
V.24 (RS-232), RS-422, RS-485	
D-SUB-9 plug	
Plug-in/screw connection via COMBICON	
Plug-in/screw connection via COMBICON	
UART/NRZ: 7/8 bit data, 1/2 bit stop, 1 bit parity	
Software handshake, Xon/Xoff or hardware handshake RTS/CTS	
0.3 ; 0.6 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 38.4 ; 57.6 ; 115.2 ; 187.5 ; 230.4 kbps	
390 Ω / 180 Ω / 390 Ω (configurable)	
RJ45 socket, shielded	
10/100 Mbps, autonegotiation	
≤ 100 m (shielded twisted pair)	
TCP/IP, UDP	
ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP	
Web-based management, SNMP, emergency exit with Telnet and serial	
-25 °C ... 60 °C	
DIN EN 50178 (VCC // Ethernet // Serial)	
1.5 kV_{rms} (50 Hz, 1 min.)	
Conformance with EMC Directive 2004/108/EC	
22.5 mm / 99 mm / 116 mm	
508 listed	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL COMSERVER BASIC 232/422/485[1])	**2313478**	1

Accessories

PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA 9 SUB 25/BB/2METER	**2761059**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

MPI-SET device server, V.24 (RS-232) cable, and MPI adapter

Technical data	
24 V DC ±20% (via plug-in COMBICON screw terminal block)	
24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	
100 mA (24 V DC)	
V.24 (RS-232)	
D-SUB-9 plug	
-	
-	
Serially asynchronous UART/NRZ, 8 data, 1 stop, odd parity, 11 bit character length	
Hardware handshake RTS/CTS	
19200, 38400 bit/s, adjustable via web-based management	
-	
RJ45 socket, shielded	
10/100 Mbps, autonegotiation	
100 m (shielded twisted pair)	
TCP/IP, UDP	
ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP	
Web-based management, SNMP, emergency exit with Telnet and serial	
-25 °C ... 60 °C	
DIN EN 50178 (VCC // Ethernet // Serial)	
1.5 kV_{rms} (50 Hz, 1 min.)	
Conformance with EMC Directive 2004/108/EC	
22.5 mm / 99 mm / 116 mm	
-	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL COMSERVER-MPI-SET	**2313588**	1

Accessories

PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA 9 SUB 25/BB/2METER	**2761059**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Device servers for converting serial interfaces

FL COMSERVER PRO...

Individual solutions that cannot be implemented with the the standard devices can be created with this freely programmable version. To do this, users program their own application program.

Features:

– Freely programmable version
– Programming in BCL (similar to BASIC)
– Integrated web server for visualization
– Pre-processing of data stream
– Adaptation of old protocols for compatibility with modern systems

A PCL program is required for operation. In addition, an HTML visualization can be saved on the web server in order to make settings in the BCL program or to display states.

Example applications when supplied as standard

Some program samples are available free of charge. These samples can be adapted and developed further as required.

– IP scanner: monitoring of network devices via ping
– TCP multicast: program for sending data to multiple devices across the network using the TCP protocol
– Modbus I/O monitor: in combination with a Modbus bus coupler, I/O data can be processed, controlled, and visualized

Software development kit (SDK)

A BCL program can be created using any editor. The SDK provides support when transferring the BCL program and for HTML visualization in the form of batch files.

The current version of the SDK together with samples can be found on our website.

Notes:

1) EMC: Class A product, see page 553

Freely programmable device server with HTTP server

Ex: // Applied for: cUL / UL

Technical data

Supply		
Supply voltage		24 V AC/DC ±20% (via plug-in COMBICON screw terminal block)
Supply voltage		24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		100 mA (24 V DC)
Serial port		
Interfaces		V.24 (RS-232), RS-422, RS-485
Connection method	V.24 (RS-232)	D-SUB-9 plug
	RS-422	Plug-in/screw connection via COMBICON
	RS-485	Plug-in/screw connection via COMBICON
Data format/coding		UART/NRZ: 7/8 bit data, 1/2 bit stop, 1 bit parity
Data flow control/protocols		Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed		0.3 ; 0.6 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 38.4 ; 57.6 ; 115.2 ; 187.5 ; 230.4 kbps
Termination resistor		390 Ω / 180 Ω / 390 Ω (configurable)
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps, autonegotiation
Transmission length		≤ 100 m (shielded twisted pair)
Supported protocols		TCP/IP, UDP
Auxiliary protocols		ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP
Functions		
Management		Web-based management, SNMP, serial emergency access
General data		
Ambient temperature (operation)		-25 °C ... 60 °C
Electrical isolation		DIN EN 50178 (VCC // Ethernet // Serial)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC
Dimensions	W / H / D	22.5 mm / 99 mm / 116 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FL COMSERVER PRO..., freely programmable version. Similar to BASIC. HTTP server for visualization. Software development kit containing examples and documentation supplied as standard	**FL COMSERVER PRO 232/422/485[1])**	**2313465**	1

Accessories

RS-232-D-SUB cable, length: 2 m			
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1

Device servers for converting serial interfaces

The **FL COMSERVER WLAN 232/422/485** enables wireless connection of serial interfaces for machine and system access. This means that controllers and control panels can be integrated into wireless LAN networks via these device servers.

This device is ideal for use in all mobile and industrial mobile applications involving serial interfaces.

Easy cable replacement is performed in ad-hoc or infrastructure operating mode. Serial devices can be directly connected to each other or integrated into the network via access points.

Comprehensive diagnostics displays and an LED bar graph for displaying the wireless reception performance are integrated. They ensure straightforward startup and continuous monitoring during operation. In addition, the current signal strength can be read digitally and processed externally.

Interfaces:

– V.24 (RS-232), RS-422, RS-485, and USB
– 54 Mbps WLAN interface according to IEEE 802.11 b/g
– External SMA antenna connection

Security:

– WEP, up to 128 bits
– WPA / WPA2 (AES / TKIP)
– LED bar graph for displaying wireless reception performance

Features:

– Ad-hoc or infrastructure operation
– Software for virtual COM ports supplied as standard
– Extended temperature range of -25°C to +60°C
– Redundant power supply and modular station structure with TBUS connectors
– 3-way electrical isolation VCC // V.24 (RS-232)/RS-422/RS-485 // network
– LED diagnostic indicators
– Straightforward configuration software

Applications:

– Replacement of cables with wireless connections
– Network integration, wireless integration of automation devices and serial devices
– Remote maintenance

Serial device server for 802.11 Wireless LAN

Technical data

Supply		
Supply voltage		10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		24 V DC ±20% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		≤ 100 mA (24 V DC)
Serial port		
Interfaces		V.24 (RS-232), RS-422, RS-485
Connection method	V.24 (RS-232)	D-SUB-9 plug
	RS-422	Plug-in/screw connection via COMBICON
	RS-485	Plug-in/screw connection via COMBICON
Data format/coding		Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length
Data flow control/protocols		Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed		0.3 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 31.25 ; 38.4 ; 57.6 ; 75 ; 93.75 ; 115.2 kbps
Termination resistor		390 Ω / 180 Ω / 390 Ω (can be connected)
Wireless interface		
Interfaces		WLAN as per IEEE 802.11 b/g
Function		Infrastructure mode, ad-hoc mode
Transmission speed		≤ 54 Mbps
Security		802.11i, WPA PSK (preshared key), WPA2 PSK, AES, WEP 64 bit/128 bit, TKIP
Antenna connection		External
Transmission power		-28 dBm to 20 dBm (can be set via software)
Receiver sensitivity		-85.00 dBm
Frequencies		2.402 GHz ... 2.48 GHz (ISM bandwidth)
Supported protocols		TCP/IP, UDP
General data		
Ambient temperature (operation)		-25 °C ... 60 °C
Electrical isolation		(VCC // WLAN, RS-232, RS-422, RS-485, USB)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC
Dimensions	W / H / D	22.5 mm / 99 mm / 121 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Serial device server, to convert a serial interface to 802.11 WLAN, incl. CD-ROM with drivers, additional software and user documentation TCP, UDP	**FL COMSERVER WLAN 232/422/485**	**2313559**	1

Accessories

RS-232-D-SUB cable, length: 2 m			
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
OMNI omni-directional antenna with protection against vandalism	**RAD-ISM-2400-ANT-VAN- 3-0-SMA**	**2885867**	1
PANEL directional wireless antenna (without cable)	**RAD-ISM-2400-ANT-PAN- 8-0**	**2867610**	1
Antenna extension cable	**RAD-CAB-EF393- 3M**	**2867649**	1

4 kV Ethernet ISOLATOR for electrical isolation

The **FL ISOLATOR** is used for electrical isolation in copper-based Ethernet networks.

In industrial environments, potential differences pose a constant problem with regard to interference-free data transmission.

The high-quality isolation for up to 4 kV provides reliable protection for Ethernet devices and interfaces. This results in considerably higher immunity to interference in industrial applications.

The **FL ISOLATOR 100-M12** has been specifically developed for use in the railway industry. Featuring M12 connection technology and optional wall mounting, this network isolator can be used flexibly.

Features:

– Electrical isolation of data cables and cable shielding
– Dielectric strength up to 4 kV
– Transmission speed of up to 1000 Mbps, device-specific
– No power supply required
– Protection against aggressive environmental influences, particularly harsh industrial environments, thanks to coated PCB
– Approval for railway applications (rolling stock) according to EN 50155 and EN 50121
– Extended temperature range

Ethernet

PROFINET

Modbus

Transmission speeds up to 1 Gbps, two RJ45 connections

Technical data

Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100/1000 Mbps
Transmission length		≤ 100 m (total length across both ports (dependent on data rate and cable used))
General data		
Ambient temperature (operation)		-25 °C ... 75 °C
Electrical isolation		(Ethernet // Ethernet)
Test voltage		4 kV AC (50 Hz, 1 min.)
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC
Standards/regulations		EN 50121 and EN 50155 (for railway applications)
Dimensions	W / H / D	22.5 mm / 99 mm / 92 mm
Conformance / approvals		
UL, USA / Canada		508 listed

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Passive network isolator, for electrical isolation in Ethernet networks. For protection against potential differences of up to 4 kV. - For transmission speeds of up to 1 Gbps, connection: 2x RJ45 sockets - For transmission speeds of up to 100 Mbps, connection: 2x RJ45 sockets - For transmission speeds of up to 100 Mbps, connection: 1x RJ45 socket and COMBICON plug-in screw terminal block	**FL ISOLATOR 1000-RJ/RJ**	**2313915**	1
Passive network isolator, for electrical isolation in Ethernet networks. For protection against potential differences of up to 4 kV. - For transmission speeds of up to 100 Mbps, connection: two M12 sockets (D-coded)			

Accessories

Mounting material, for DIN rail mounting			
M12 connector, straight			
Bus system cable, Ethernet, 4-pos., PUR, halogen-free, RAL 5021 (water blue), shielded, straight M12 plug (D-coded) to free cable end, cable length: free input (0.2 ... 40.0 m)			
Patch cable, CAT5, preassembled			
	0.5 m	**FL CAT5 PATCH 0,5**	**2832263** 10
	1 m	**FL CAT5 PATCH 1,0**	**2832276** 10
	2 m	**FL CAT5 PATCH 2,0**	**2832289** 10
	3 m	**FL CAT5 PATCH 3,0**	**2832292** 10
Patch cable, CAT6, preassembled			
	0.5 m	**FL CAT6 PATCH 0,5**	**2891288** 10
	1 m	**FL CAT6 PATCH 1,0**	**2891385** 10
	2 m	**FL CAT6 PATCH 2,0**	**2891589** 10
	3 m	**FL CAT6 PATCH 3,0**	**2891686** 10

Ethernet

PROFINET

Modbus

Transmission speeds up to 100 Mbps, two RJ45 connections

Ethernet

PROFINET

Modbus

Transmission speeds up to 100 Mbps RJ45 and screw connection

Ethernet

PROFINET

Modbus

Transmission speeds up to 100 Mbps M12 connection

Technical data

RJ45 socket, shielded 10/100 Mbps ≤ 100 m (total length across both ports (dependent on data rate and cable used))	RJ45 socket, shielded 10/100 Mbps ≤ 100 m (total length across both ports (dependent on data rate and cable used))	M 12 plug-in connectors (D-coded, female) 10/100 Mbps ≤ 100 m (total length across both ports (dependent on data rate and cable used))
-25 °C ... 75 °C (Ethernet // Ethernet) 4 kV AC (50 Hz, 1 min.) Conformance with EMC Directive 2004/108/EC EN 50121 and EN 50155 (for railway applications) 22.5 mm / 99 mm / 92 mm	-25 °C ... 75 °C (Ethernet // Ethernet) 4 kV AC (50 Hz, 1 min.) Conformance with EMC Directive 2004/108/EC EN 50121 and EN 50155 (for railway applications) 22.5 mm / 99 mm / 92 mm	-40 °C ... 75 °C (Port X1//port X2) 4 kV AC (50 Hz, 1 min.) Conformance with EMC Directive 2004/108/EC EN 50121 and EN 50155 (for railway applications) 66 mm / 91 mm / 34 mm
508 listed	508 listed	UL applied for

Ordering data

Type	Order No.	Pcs. / Pkt.
FL ISOLATOR 100-RJ/RJ	**2313931**	1

Type	Order No.	Pcs. / Pkt.
FL ISOLATOR 100-RJ/SC	**2313928**	1

Type	Order No.	Pcs. / Pkt.
FL ISOLATOR 100-M12	**2902985**	1

Accessories

FL CAT5 PATCH 0,5	**2832263**	10
FL CAT5 PATCH 1,0	**2832276**	10
FL CAT5 PATCH 2,0	**2832289**	10
FL CAT5 PATCH 3,0	**2832292**	10
FL CAT6 PATCH 0,5	**2891288**	10
FL CAT6 PATCH 1,0	**2891385**	10
FL CAT6 PATCH 2,0	**2891589**	10
FL CAT6 PATCH 3,0	**2891686**	10

Accessories

FL CAT5 PATCH 0,5	**2832263**	10
FL CAT5 PATCH 1,0	**2832276**	10
FL CAT5 PATCH 2,0	**2832289**	10
FL CAT5 PATCH 3,0	**2832292**	10
FL CAT6 PATCH 0,5	**2891288**	10
FL CAT6 PATCH 1,0	**2891385**	10
FL CAT6 PATCH 2,0	**2891589**	10
FL CAT6 PATCH 3,0	**2891686**	10

Accessories

FL EPA RMS	**2701133**	1
VS-M12MS-IP20-93E-LI/2,0	**1406056**	1
NBC-MSD SCO/.../...	**1408713**	1

Passive patch panel for the DIN rail

The mini patch panels provide a convenient alternative to on-site assembly of RJ45 connectors.

The cross-control-cabinet field cabling is simply connected to screw, spring-cage or LSA connection terminal blocks, depending on which option is selected. The connection to the terminal devices is then completed using pre-assembled RJ45 patch cables.

The completely shielded cable routing ensures transmission quality of up to 1000 Mbps.

General features

– CAT5e
– 10/100 Mbps
– Mounted on DIN rails
– Safe shield connection to ground potential

FL CAT 5 TERMINAL BOX

– RJ45 socket
– Screw terminal blocks
– 4-pin assignment: 1, 2, 3, 6
– Clearly labeled with PROFINET cable colors

FL-PP-RJ45-SCC

– RJ45 socket
– Spring-cage connection terminal blocks
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail via jumpers

FL-PP-RJ45-SC

– RJ45 socket
– Screw terminal blocks
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail via jumpers

FL-PP-RJ45-LSA

– RJ45 socket
– LSA connection terminal blocks
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail via jumpers

FL-PP-RJ45/RJ45

– RJ45 socket
– RJ45 socket
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail via jumpers

Notes:
For mini patch panel with electrical isolation, see page 414
For Ethernet cables and corresponding crimping pliers, see page 417
For RJ45 patch cables, see page 418

Ethernet

PROFINET

Modbus

Mini patch panel with various connection options

Technical data

Cable impedance	100 Ω
Transmission speed	10/100 Mbps
Connection line	Twisted pair, shielded, CAT5 or better
Transmission length	100 m (including patch cables)
Plug connection	RJ45 CAT5e
Insertion/withdrawal cycles	≤ 2500
Cable cross section (max./min.)	10 mm / 6 mm
Screw connection solid/stranded/AWG	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Ambient temperature (operation)	-25 °C ... 70 °C
Housing material	PVC/PA
Weight	39 g
Dimensions W / H / D	25 mm / 90 mm / 52 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Patch panel, one **RJ45 socket to 4 screw connection terminal blocks** (assignment 1, 2, 3, 6), CAT5e, 10/100 Mbps, DIN rail mounting, IP20, shield contacting on DIN rail	**FL CAT5 TERMINAL BOX**	**2744610**	1
Patch panel, one **RJ45 socket to 8 spring-cage connection terminal blocks** (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	**FL-PP-RJ45-SCC**	**2901642**	1
Patch panel, one **RJ45 socket to 8 screw connection terminal blocks** (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	**FL-PP-RJ45-SC**	**2901643**	1
Patch panel, one **RJ45 socket to 8 IDC connection terminal blocks** (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	**FL-PP-RJ45-LSA**	**2901645**	1
Patch panel, two RJ45 sockets (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	**FL-PP-RJ45/RJ45**	**2901646**	1

Ethernet cables, plugs, tools

The Ethernet cables of category 5e (up to 125 Mbps) which have been developed especially for industrial applications round off the range to form a complete industrial installation concept.

The installation cable **FL CAT 5 HEAVY...** with solid twisted pair conductors, is particularly suitable for permanent installation outside the control cabinet or switch box. It is characterized by a highly durable second outer sheath made of polyurethane (PUR). With an external diameter of 7.5 mm, the cable has a high degree of mechanical load carrying capacity and fits perfectly through standard cable screw connections. Inside the control cabinet, the second outer sheath is simply removed (Ø 5.75 mm). The cable can therefore be assembled directly with the RJ45 connector and connected to the modules. In line with CAT 5e, cable lengths up to 100 m are permissible.

The flexible and lightweight design **FL CAT5 FLEX...** is used for wiring inside the control cabinet (e.g., as patch cable between switch and terminal device). Flexible single wires and a cable diameter of 5.75 mm facilitate installation where space is restricted. The permissible cable length with these highly flexible cables is 50 m.

Both cable types can be supplied ready assembled with RJ45 connector if required (see order sample).

Ethernet plugs and tools

The **FL PLUG...** connectors and matching crimping pliers are available for on-site assembly. The connectors comply with category 5e (up to 125 MHz) due to an extremely low cross-talk behavior. Therefore, the connectors can be used in 10/100 Mbps systems as well as in 1000Base-T-systems. For connections that are not crossed, it is recommended that you use the connector set (two connectors) with gray bend protection sleeve and for connections that are crossed, the connector set with green bend protection sleeve.

Ethernet

Ethernet-cable, 2-pair, CAT5/CAT5e in solid and stranded

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
CAT5e-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy duty installation cable 2 x 2 x 0.22 mm², solid conductor, shielded, Outer sheath: 7.5 mm Ø ±0.3 mm Inner sheath: 5.75 mm Ø ±0.15 mm (Length in meters as per customer specifications)	**FL CAT5 HEAVY**	**2744814**	1
CAT5e-SF/UTP cable, same as before, however, assembled with RJ45 connector (refer to the order sample) on both sides	**FL CAT5 HEAVY CONF/**	**2744827**	1
CAT5e-SF/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light duty stranded installation cable 2 x 2 x 0.14 mm², fine strand conductor, shielded, Outer sheath: 5.75 mm Ø ±0.15 mm (Length in meters as per customer specifications)	**FL CAT5 FLEX**	**2744830**	1
CAT5e-SF/UTP cable, same as before, however, assembled with RJ45 connector (refer to the order sample) on both sides	**FL CAT5 FLEX CONF/**	**2744843**	1

Accessories

RJ45 connector, shielded, with bend protection sleeve, x 2			
- Gray for straight cables	**FL PLUG RJ45 GR/2**	**2744856**	1
- Green for crossed cables	**FL PLUG RJ45 GN/2**	**2744571**	1
Crimping pliers, for assembling the RJ45 connectors	**FL CRIMPTOOL**	**2744869**	1

Ordering example for cable **with** connector

Light-weight and flexible installation cable, assembled with RJ45 connectors, crossover assignment, 3.5 m long

Quantity	Order No.	Connection	Length [m][1])
1	2744843	/ CO	/ 3.5

CO ≙ Crossover
LI ≙ Line

[1]) min. 0.25 m
max. 50 m with FL CAT5 Flex
max. 100 m with FL CAT5 Heavy
step width: 0.25 m

Ordering example for cable **without** connector

Heavy-duty installation cable, 20 m long

Cable length	Order No.	Order designation
20	2744814	FL CAT5 HEAVY

In meters

RJ45 patch cables

The preassembled patch cables have been specially developed for industrial use.

They are suitable for the quick installation of Ethernet components and patch fields or termination devices within a control cabinet. They form the link to a seamless high quality Ethernet system.

The patch cables are characterized by a new bend protection and are available in graded lengths from 0.3 to 20 m.

All patch cables are designed as 1:1 cable. They come with four pairs of conductors and are assembled with RJ45 plugs according to IEC 603-7/Class A. Each cable is tested separately for its transmission properties.

With their high, universal wiring quality across the active and passive infrastructure, the patch cables fulfill the requirements of the standards for CAT5/CAT6.

Notes:

Additional accessories for network installation can be found in the "Ethernet networks" section on page 62

Ethernet

RJ45 patch cables for IP20 applications

Technical data

	FL CAT5 PATCH 0,3	FL CAT6 PATCH 0,3
Cable, properties		
External diameter	5.5 mm	5.5 mm
Single wire, material	Cu litz wire	Cu litz wire
Single wires per module	8	8
Single wire, cross section	0.14 mm²	0.14 mm²
Outer sheath, material	LSFROH	LSFROH
Smallest bending radius, fixed installation	30 mm	30 mm
Shielding	SF/UTP	S/FTP
Connector		
Volume resistance	≤ 0.003 Ω (IEC 60603-7)	≤ 0.003 Ω (IEC 60603-7)
General data		
Ambient temperature (operation)	-10 °C ... 60 °C	-10 °C ... 60 °C

Ordering data

Description	Length of cable	Type	Order No.	Pcs. / Pkt.
Patch cable, CAT5, preassembled				
	0.3 m	**FL CAT5 PATCH 0,3**	**2832250**	10
	0.5 m	**FL CAT5 PATCH 0,5**	**2832263**	10
	1 m	**FL CAT5 PATCH 1,0**	**2832276**	10
	1.5 m	**FL CAT5 PATCH 1,5**	**2832221**	10
	2 m	**FL CAT5 PATCH 2,0**	**2832289**	10
	3 m	**FL CAT5 PATCH 3,0**	**2832292**	10
	5 m	**FL CAT5 PATCH 5,0**	**2832580**	10
	7.5 m	**FL CAT5 PATCH 7,5**	**2832616**	10
	10 m	**FL CAT5 PATCH 10,0**	**2832629**	10
Patch cable, CAT6, preassembled				
	0.3 m	**FL CAT6 PATCH 0,3**	**2891181**	10
	0.5 m	**FL CAT6 PATCH 0,5**	**2891288**	10
	1 m	**FL CAT6 PATCH 1,0**	**2891385**	10
	1.5 m	**FL CAT6 PATCH 1,5**	**2891482**	10
	2 m	**FL CAT6 PATCH 2,0**	**2891589**	10
	3 m	**FL CAT6 PATCH 3,0**	**2891686**	10
	5 m	**FL CAT6 PATCH 5,0**	**2891783**	10
	7.5 m	**FL CAT6 PATCH 7,5**	**2891880**	10
	10 m	**FL CAT6 PATCH 10**	**2891877**	10
	12.5 m	**FL CAT6 PATCH 12,5**	**2891369**	5
	15 m	**FL CAT6 PATCH 15,0**	**2891372**	5
	20 m	**FL CAT6 PATCH 20,0**	**2891576**	5

Product overview

Mobile phone network

	SMS relay	Modem	Industrial mobile phone router		
System	I/O	GPRS RS-232	GPRS/EDGE Ethernet	UMTS/HSPA Ethernet	UMTS/HSPA/CDMA Ethernet
Description	**GSM/SMS relays,** 6 analog/digital inputs, 4 digital outputs	Quadband modem, for GPRS and GSM	**Industrial mobile phone router,** for GPRS/EDGE	**Industrial mobile phone router,** for UMTS/HSPA with GPRS/EDGE fallback	**MGUARD security router**
Page	421	423	423	423	425

Public network

	DSL broadband router		Analog modem
System	ADSL Annex A, B Ethernet	ADSL Annex A, B Ethernet/RS-232	V.34 (analog) Ethernet/RS-232
Description	**DSL broadband router/modem,** with firewall	**DSL broadband router/modem,** with firewall, VPN, and serial device server	**Analog modem,** for dial-up line/permanent line operation
Page	427	427	428

Private network

	SHDSL
System	Ethernet RS-232/RS-422/RS-485
Description	**Extender (SHDSL)** for in-house cables
Page	431

Accessories

System	PSI-GSM/UMTS-ANT-OMNI... PSI-GSM/UMTS-QB-ANT	PSI-CAB-GSM/UMTS... CSMA-LAMBDA/4-2.0-BS-SET	PSI-MPI/RS232-PC PSI-MODEM-MPI-SET1	PSI-MODEM-SPLITTER PSI-CA-MODEM-SPLITTER	DT-TELE-RJ45
Description	Multiband antennae for UMTS and quadband GSM	Antenna extension cables and surge protection for UMTS and quadband GSM	Programming adapter and programming set for remote maintenance	Interface converter RS-232 flat-ribbon connecting cable	SHDSL surge protection
Page	432	432	433	433	433

Mobile phone network/ SMS relay modules

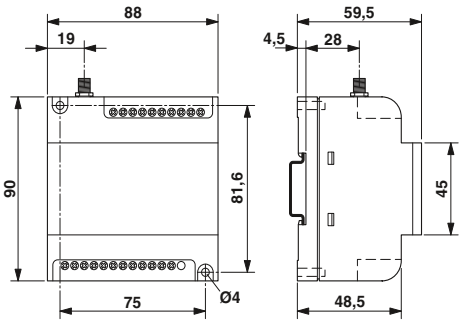
The PSI-MODEM-SMS-REL… is a compact remote control and signaling system. Six digital or configurable analog/digital inputs and four relay outputs with PDT contacts are monitored and controlled using SMS messages via any GSM mobile phone network.

Product features:

- Installation component device as per DIN 43880
- For worldwide use
- Message via SMS in case of status change at the input
- Alarming in case of voltage failure via SMS
- Switching on call
- SMS remote control of the outputs
- Switching of outputs for a predefined time
- SMS status query of all inputs and outputs
- Password protection
- Integrated phone book for up to 50 numbers
- Max. 5 recipients per SMS
- Configuration software and programming cable supplied as standard
- Easy configuration on the PC without programming knowledge

Possible areas of application for the PSI-MODEM-SMS-REL… are:

- Building and system monitoring
- Switching of pumps
- Monitoring of levels and temperatures
- Alarm and domestic engineering
- Climate and ventilation engineering



SMS remote and signaling system with six inputs and four relay outputs

Technical data

Supply		
Supply voltage	12 V DC ... 48 V DC	110 V AC ... 240 V AC
Nominal current consumption	15 mA	10 mA
Input data		
Switching input	Digital: 6 x $U_{N,}$ switching threshold 9.5 V DC Analog: 0 - 10 V	Digital: 6 x $U_{N,}$ switching threshold 85 V AC Analog: -
Output data		
Contact type	Single contact, 4x1 PDT contact	
Max. switching voltage	250 V AC/DC	
Min. switching voltage	12 V AC/DC	
Limiting continuous current	10 A	
GSM		
Frequencies	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM))	
SIM interface	3 volt SIM card	
Antenna connection	50 Ω impedance SMA antenna socket	
General data		
Ambient temperature (operation)	-25 °C ... 55 °C	
Electromagnetic compatibility	Conformance with R&TTE directive 1999/5/EC	
Dimensions W / H / D	88 mm / 90 mm / 60 mm	

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
SMS relay with six analog or digital configurable inputs and four relay outputs	12 V DC ... 48 V DC	PSI-MODEM-SMS-REL/6ADI/4DO/DC	2313520	1
SMS relay with six digital inputs and four relay outputs	110 V AC ... 240 V AC	PSI-MODEM-SMS-REL/6 DI/4DO/AC	2313513	1

Accessories

Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm	PSI-GSM/UMTS-QB-ANT	2313371	1
Multiband antenna for external panel and external mast mounting for UMTS and quad-band GSM, with omnidirectional characteristics, 5 m antenna cable with SMA round connector	PSI-GSM/UMTS-ANT-OMNI-2-5	2900982	1
Antenna extension cable for UMTS and quad-band GSM, 5 m long, antenna cable with SMA connector and SMA coupling	PSI-CAB-GSM/UMTS- 5M	2900980	1
Antenna extension cable for UMTS and quad-band GSM, 10 m long, antenna cable with SMA connector and SMA coupling	PSI-CAB-GSM/UMTS-10M	2900981	1
Surge protection for UMTS and quad-band GSM antenna, with SMA connector and SMA coupling	CSMA-LAMBDA/4-2.0-BS-SET	2800491	1
Connection cable, D-9-SUB to USB, with adapter D-9-SUB to D-25-SUB	CM-KBL-RS232/USB	2881078	1

Mobile phone network/ serial quad band modem for GPRS and GSM

Send V.24 (RS-232) data all around the world via mobile phone network

Mobile phone network:
– GSM mobile phone networks: 850, 900, 1800, and 1900 MHz
– For worldwide use

GPRS TCP/IP connection:
– Connection established via IP addresses
– Client/server functionality
– IPT compatible
– Integrated TCP/IP stack for TCP and UDP connections
– Data rates of up to 53.6 kbps
– Security:
  - Firewall

GSM dial-up connection:
– Connection established via data phone number (CSD)
– Security:
  - Connection established with password protection
  - Selective call acceptance
  - Callback function

V.24 (RS-232) interface:
– Freely parameterizable (baud rate, data bits, parity, stop bit, flow control)

Digital I/Os:
– Two digital switching inputs: sending of freely configurable text messages (SMS, FAX, e-mail)
– One switching output on the backplane

Additional features:
– Encryption of SIM card PINs
– Can be used regardless of controller manufacturer
– High electromagnetic compatibility
– Electrical isolation
– NEW: convenient configuration software
– Configuration via SMS

Notes:

1) EMC: Class A product, see page 553

Quad-band modem for GPRS and GSM with RS-232 interface, integrated TCP/IP stack and 2 alarm inputs

Technical data

Supply		
Supply voltage		10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		< 350 mA (24 V DC)
Stand-by current consumption		< 80 mA
V.24 (RS-232) interface		
Connection method		D-SUB-9 plug
Data format/coding		Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length
Data flow control/protocols		Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed		Automatic data rate detection (default) or fixed setting to 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps, can be set via software
Mobile phone network		
Frequencies		850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM))
SIM interface		1.8 volt, 3 volt
GPRS compatibility		Class 10, Class B
Network function		4 time slots for receiving data, 2 time slots for transmitting data. The PIN is saved in the modem. After a voltage interruption, there is automatic redialing into the network Integrated TCP/IP stack, independent connection establishment.
Network check		LED to show data signal quality
Antenna connection		50 Ω impedance SMA antenna socket
Input/output		
Switching input		2 x U_{Nom} 24 V DC / 5 mA, input range 9...60 V DC
Switching output		On the backplane (10 V DC ... 30 V DC / 80 mA at 24 V DC)
General data		
Ambient temperature (operation)		-25 °C ... 60 °C
Electrical isolation		(VCC // V.24 (RS-232) // GSM)
Test voltage		1.5 kV
Approvals for countries		EU, USA, Canada, other countries in preparation
Electromagnetic compatibility		Conformance with R&TTE directive 1999/5/EC
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial GPRS/GSM modem with RS-232 interface, scope of supply: modem, CD with configuration software and user manual	**PSI-GPRS/GSM-MODEM/RS232-QB**[1])	**2313106**	1

Accessories

Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm	**PSI-GSM/UMTS-QB-ANT**	**2313371**	1
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
RS-232-D-SUB cable, length: 2 m	**PSM-KA9SUB9/BB/2METER**	**2799474**	1
RS-232-D-SUB cable, length: 0.5 m	**PSM-KA9SUB9/BB/0,5METER**	**2708520**	1

Mobile phone network/ mobile phone routers with firewall and VPN

Mobile phone routers support high-performance remote connections to remote Ethernet networks. These connections can be used to transmit sensitive data securely over mobile phone networks.

The integrated firewall and VPN (Virtual Private Network) support reliably protect the application against unauthorized access. The Ethernet connection can be used for system-wide communication between all connected components in the network, such as drives, controllers, control panels or visualization PCs.

Mobile TCP/IP connection:

– Connection established via IP addresses
– GPRS/EDGE data rates of up to 210 kbps
– UMTS/HSPA data rates of up to 7.2 Mbps
– Security:
  - Firewall
  - NAT table

VPN (virtual private network):

– IPsec and OpenVPN support
– Up to three VPN tunnels simultaneously
– Authentication with X.509 certificates and via pre-shared key (PSK)
– VPN remote start via call or SMS
– 1:1 NAT in the VPN

Digital I/Os:

– 6 digital switching inputs: Sending of freely configurable text messages (SMS, FAX, e-mail) and starting of user-defined functions
– Four switching outputs: can be activated via SMS and Ethernet and for GSM and connection diagnostics

Additional features:

– Configuration via web-based management
– Upload and download configuration
– Configurable daily restart
– Continuous connection monitoring
– High electromagnetic compatibility
– Electrical isolation

Notes:

1) EMC: Class A product, see page 553

GPRS/EDGE and UMTS/HSPA mobile phone routers for worldwide network access

Technical data

Supply	
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption	< 200 mA (24 V DC)
Stand-by current consumption	< 90 mA (stand by)
Ethernet interface	
Connection method	RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation
Transmission length	100 m (shielded twisted pair)
Functions	
Management	Web-based management, SNMP
Mobile phone network	
Frequencies	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 850 MHz (0.25 W (UMTS)) / 1900 MHz (0.25 W (UMTS)) / 2100 MHz (0.25 W (UMTS))
SIM interface	1.8 volt, 3 volt
GPRS compatibility	Class 12, Class B
Network check	LED bar graph to display receive quality
Antenna connection	50 Ω impedance SMA antenna socket
Input/output	
Switching input	6 x $U_{Nom,}$ input range 10 V DC ... 30 V DC/5 mA
Switching output	4 x $U_{Nom,}$ input range 10 V DC ... 30 V DC/50 mA, short-circuit-proof
General data	
Ambient temperature (operation)	-25 °C ... 65 °C (not aligned)
Electrical isolation	(VCC // UMTS // Ethernet // PE)
Test voltage	1 kV (50 Hz, 1 min.)
Approvals for countries	EU, USA, Canada, other countries in preparation
Electromagnetic compatibility	Conformance with R&TTE directive 1999/5/EC
Dimensions W / H / D	45 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial mobile phone router, with integrated firewall and VPN, 6 digital inputs and 4 outputs, and continuous connection monitoring			
- For UMTS/HSPA with GPRS/EDGE fallback and dual SIM for backup provider	**PSI-MODEM-3G/ROUTER**	**2314008**	1
- For GPRS/EDGE quad band, 35 mm housing width	**PSI-MODEM-GSM/ETH[1])**	**2313355**	1

Accessories

Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm	**PSI-GSM/UMTS-QB-ANT**	**2313371**	1
Multiband antenna for external panel and external mast mounting for UMTS and quad-band GSM, with omnidirectional characteristics, 5 m antenna cable with SMA round connector	**PSI-GSM/UMTS-ANT-OMNI-2-5**	**2900982**	1
Antenna extension cable for UMTS and quad-band GSM, 5 m long, antenna cable with SMA connector and SMA coupling	**PSI-CAB-GSM/UMTS- 5M**	**2900980**	1
Antenna extension cable for UMTS and quad-band GSM, 10 m long, antenna cable with SMA connector and SMA coupling	**PSI-CAB-GSM/UMTS-10M**	**2900981**	1

Mobile phone network/ MGUARD security routers

Industrial mobile phone routers featuring mGuard technology for global communication via UMTS and CDMA networks.

Thanks to the integrated high-speed mobile phone interface and 4-port switch in compact metal housing, the new **TC MGUARD RS2/4000 VPN** security appliances create a system for global, secure industrial remote communication.

They have an SD card slot at the front for configuration memory. The SD cards can be used for starting up or replacing the devices quickly and easily. The devices feature an extended temperature range and have a buffered realtime clock and trusted platform module (TPM) for secure key generation and management. They support precise time synchronization and positioning, specifically for mobile applications, via GPS and GLONASS.

The **TC MGUARD RS4000 3G** devices provide high-availability high-end security for industry and a remote maintenance infrastructure for the secure connection of machines and systems. For maximum availability, an additional external network is supported redundantly alongside the internal network (LAN) and the external network (WAN) in the form of the mobile phone interface. The integrated 4-port switch offers management features and supports EtherNet/IP™.

The **TC MGUARD RS2000 3G** devices are designed for applications with fewer complex requirements and allow secure remote maintenance of machines and systems in the field via the Internet. In this context, they are used as industrial remote service routers with a simplified configuration. The integrated 4-port switch saves valuable space on the DIN rail.

Both versions have all the necessary standard functions for operating an Ethernet network that is both flexible and robust.

Features:

– Port mirroring
– Configuration can be stored externally
– Web-based management, SNMP
– Replaceable configuration memory
– Comprehensive connection options
– Flexible routing
– Intelligent stateful inspection firewall
– Secure remote services (VPN) according to IPsec standard

Serial device server included

The integrated COMSERVER function is used to integrate serial RS-232 interfaces into Ethernet networks. This provides an easy way of implementing functions such as cable replacement or network integration.

– Cable replacement: two devices in combination tunnel serial connections via Ethernet
– Network integration: you can integrate automation devices such as controllers or frequency inverters into a network using corresponding programming and diagnostics software

Device Manager

The Device Manager simplifies the management of MGUARD security appliances. The tool features a template mechanism that enables the user to configure and manage all MGUARD devices centrally – from a few hundred devices to several thousand.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 45

N

UMTS/HSPA mobile phone router with firewall and VPN, manageable 4-port switch, DMZ port and second WAN interface

N

UMTS/HSPA mobile phone router with firewall and VPN, integrated 4-port switch

Technical data

Supply		
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption	< 200 mA (24 V DC)	< 200 mA (24 V DC)
Ethernet interface		
Connection method	RJ45 socket, shielded	RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation	10/100 Mbps, autonegotiation
Transmission length	100 m (shielded twisted pair)	100 m (shielded twisted pair)
Functions		
Management	Web-based management, SNMP	Web-based management, SNMP
Basic functions	Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card	Router with simplified 2-click firewall and VPN for 2 tunnels (fixed), metal housing, slot for any SD memory card
Security functions		
Number of VPN tunnels	10 (as an option, up to 250, with additional license FL MGUARD LIC VPN-250/ Order No. 2700193 or 2700192)	2 (fixed, Ipsec (IETF standard))
Encryption methods	DES, 3DES, AES-128, -192, -256	DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode	ESP-Tunnel / ESP-Transport	ESP-Tunnel / ESP-Transport
Authentication	X.509v3 certificates with RSA or PSK	X.509v3 certificates with RSA or PSK
Firewall rules	Configurable stateful inspection firewall with full scope of functions	Simplified 2-click stateful inspection firewall
Routing	Standard routing, NAT, 1:1-NAT, port forwarding	Standard routing, NAT, 1:1-NAT, port forwarding
Mobile phone network		
Frequencies	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 800 MHz (0.25 W (UMTS)) / 850 MHz (0.25 W (UMTS)) / 900 MHz (0.25 W (UMTS)) / 1900 MHz (0.25 W (UMTS)) / 2100 MHz (0.25 W (UMTS)) / 800 MHz (CDMA2000 EV-DO) / 1900 MHz (CDMA2000 EV-DO)	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 800 MHz (0.25 W (UMTS)) / 850 MHz (0.25 W (UMTS)) / 900 MHz (0.25 W (UMTS)) / 1900 MHz (0.25 W (UMTS)) / 2100 MHz (0.25 W (UMTS)) / 800 MHz (CDMA2000 EV-DO) / 1900 MHz (CDMA2000 EV-DO)
SIM interface	1.8 volt, 3 volt	1.8 volt, 3 volt
GPRS compatibility	Class 12, Class B	Class 12, Class B
Network check	LED bar graph to display receive quality	LED bar graph to display receive quality
Antenna connection	50 Ω impedance SMA antenna socket	50 Ω impedance SMA antenna socket
Input/output		
Switching input	3 x U_{Nom}, input range: 10 V DC ... 30 V DC/5 mA	3 x U_{Nom}, input range: 10 V DC ... 30 V DC/5 mA
Switching output	3 x U_{Nom}, input range: 10 V DC ... 30 V DC/250 mA, short-circuit-proof	3 x U_{Nom}, input range: 10 V DC ... 30 V DC/250 mA, short-circuit-proof
General data		
Ambient temperature (operation)	-20 °C ... 60 °C	-20 °C ... 60 °C
Electrical isolation	(VCC // PE)	(VCC // PE)
Test voltage	1 kV (50 Hz, 1 min.)	1 kV (50 Hz, 1 min.)
Dimensions W / H / D	45 mm / 130 mm / 114 mm	45 mm / 130 mm / 114 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Mobile phone router with mGuard technology, VPN and firewall, replaceable memory, GPS time synchronization, serial device server for RS-232 - 2 x WAN interface (1 x RJ45, 1 x mobile phone technology), 4 x LAN interface (RJ45, manageable), DMZ port - 1 x WAN interface (mobile phone technology), 4 x LAN interface (RJ45)	**TC MGUARD RS4000 3G VPN**	**2903440**	1

Accessories

Parameterization memory	**SD FLASH 256MB**	**2988120**	1
License to configure and operate **250 VPN tunnels** on FL MGUARD	**FL MGUARD LIC VPN-250**	**2700193**	1
License to configure **any number of tunnels** and operate **250 VPN** tunnels on FL MGUARD	**FL MGUARD LIC VPN-250 GROUP**	**2700192**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
TC MGUARD RS2000 3G VPN	**2903441**	1

Accessories

SD FLASH 256MB	**2988120**	1

Public network/ DSL broadband routers

Industrial ADSL broadband router - supports ADSL/ADSL2/ADSL2+ according to Annex A and B

The **TC DSL ROUTER** range supports the high-speed connection of industrial Ethernet or RS-232 devices to the Internet using high-availability ADSL technology. Machines, systems or complete Ethernet networks can therefore be accessed from anywhere in the world at any time using a broadband Internet connection.

Developed specifically for use in industrial environments, the TC DSL ROUTERs are suitable both for short-term high-speed access in the case of servicing and for the permanent connection of remote stations to a central company network when used in combination with the integrated security functions.

Remote maintenance (short-term high-speed access)
- Quick and easy remote access to machines, systems or Ethernet networks

Remote control (VPN tunnel)
- Permanent connection of substations to the control room for cyclic data acquisition and monitoring
- Highly secure broadband alternative to analog permanent line applications

Alarm generation and remote control
- High-availability alarm generation via e-mail
- Individual configuration of switching outputs, such as worldwide remote control of switching outputs or indication of a DSL connection abort, etc.

Features:

The DSL broadband routers are designed for worldwide and flexible use, there is no need for the application/provider requirements to be clarified in advance. This enables individual and fast startup on site.

One universal device type
- All common ADSL standards are supported (ADSL/ADSL2/ADSL2+)
- Integrated Annex A/B switchover

Note: the specifications for the standard and frequency range used (Annex) depend on the provider and are included in the access data sent by the provider.
- Annex A: DSL operation parallel to analog telephony (in most of the world)
- Annex B: DSL operation parallel to ISDN (in Germany and neighboring countries)

Individual function selection between modem or router function
- DSL modem: converter from DSL to LAN - the router/firewall function is performed by a separate router, e.g., FL MGUARD
- DSL router: DSL modem plus integrated router functions, e.g., firewall, VPN, NAT, etc.

All TC DSL routers offer increased resistance to typical industrial influences, such as temperature and EMI, and therefore increased fault tolerance and application availability.

TC DSL ROUTER X400 A/B
- Quick and easy startup
- Optimized to the key functions of an industrial DSL broadband router/modem
- Integrated firewall

TC DSL ROUTER X500 A/B
- Multifunctional for highly secure network access
- Suitable for special applications
- DSL broadband router/modem
- VPN tunneling:
  IPsec (client and server)
  Open VPN (client)
- NAT table
- Serial device server for 10/100Base-T(X) with RS-232
- Alarm inputs: send e-mails
- Switching outputs: set by WBM local/remote, VPN service, connection lost, DSL/Internet link

DSL router/modem with firewall

DSL router/modem with firewall, VPN, serial device server, inputs/outputs

	Technical data	Technical data
Supply		
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption	< 150 mA (24 V DC)	< 150 mA (24 V DC)
Stand-by current consumption	< 135 mA (stand by)	< 135 mA (stand by)
V.24 (RS-232) interface		
Connection method	-	D-SUB-9 plug
Transmission speed	-	0.3 ; 1.2 ; 2.4 ; 4.8 ; 9.6 ; 19.2 ; 38.4 ; 57.6 ; 115.2 kbps
Transmission length	-	15 m
Ethernet interface		
Connection method	8P8C RJ45 socket, shielded	8P8C RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation	10/100 Mbps, autonegotiation
Transmission length	≤ 100 m (shielded twisted pair)	≤ 100 m (shielded twisted pair)
Supported protocols	TCP/IP, UDP/IP, FTP, HTTP	TCP/IP, UDP/IP, FTP, HTTP
Auxiliary protocols	ARP, DHCP, PING (ICMP), SNMP V1, SMTP	ARP, DHCP, PING (ICMP), SNMP V1, SMTP
DSL interface		
Connection method	6P2C RJ11 socket, shielded COMBICON plug-in screw terminal block	6P2C RJ11 socket, shielded COMBICON plug-in screw terminal block
Transmission speed	≤ 25 Mbps (downstream from Internet) ≤ 1 Mbps (upstream to Internet)	≤ 25 Mbps (downstream from Internet) ≤ 1 Mbps (upstream to Internet)
Transmission length	≤ 5 km	≤ 5 km
Functions		
Management	Web-based management	Web-based management
Security functions		
Number of VPN tunnels	-	3
Firewall rules	Stateful inspection firewall	Stateful inspection firewall
Input/output		
Switching input	-	6 x $U_{Nom,}$ input range 10 V DC ... 30 V DC/5 mA
Switching output	-	4 x $U_{Nom,}$ input range 10 V DC ... 30 V DC/50 mA, short-circuit-proof
General data		
Ambient temperature (operation)	-20 °C ... 60 °C	-20 °C ... 60 °C
Electrical isolation	(VCC//ADSL//Ethernet//FE)	(VCC + IO + RS-232//ADSL//Ethernet//FE)
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
Approvals for countries	EU, other countries in preparation	EU, other countries in preparation
Electromagnetic compatibility	Conformance with R&TTE directive 1999/5/EC	Conformance with R&TTE directive 1999/5/EC
Dimensions W / H / D	45 mm / 99 mm / 112 mm	45 mm / 99 mm / 112 mm
Degree of protection	IP20	IP20

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Industrial ADSL broadband router, according to Annex A and B	**TC DSL ROUTER X400 A/B**	**2902709**	1	**TC DSL ROUTER X500 A/B**	**2902710**	1
	Accessories			**Accessories**		
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
DATATRAB, surge protection for two signal pairs of the analog and digital (DSL) telecommunication interface	**DT-TELE-RJ45**	**2882925**	1	**DT-TELE-RJ45**	**2882925**	1
DATATRAB adapter, protective adapters for inserting into the data line	**DT-LAN-CAT.6+**	**2881007**	1	**DT-LAN-CAT.6+**	**2881007**	1

Public network/ analog modems

These analog modems are specifically designed to meet industrial requirements for worldwide remote maintenance and alarm generation. Serial connections on the public, analog phone network with speeds of up to 33.6 kbps are supported, as is dial-up to the GSM mobile phone network.

Remote maintenance via dial-up connection:
– Direct access to remotely located controllers for software updates and remote diagnostics

Remote control via permanent line:
– Substations permanently connected to control room for the purpose of monitoring and controlling remote system components

Automatic alarm messaging:
– Individual, configurable SMS and e-mail messaging functions for quick resolution of faults

Features:

PSI-MODEM/ETH
Dial-up line modem for accessing a remote Ethernet network
– Permanent 128-bit authentication
– CHAP protocol

PSI-DATA/FAX-MODEM/RS232
Dial-up/permanent line modem with advanced alarm generation functions for remote control, remote maintenance, and alarm generation applications
– 1x switching input/output

PSI-DATA/BASIC-MODEM/RS232
Dial-up line modem for remote maintenance of systems with a V.24 (RS-232) interface

PSI-MODEM-BASIC/USB
Dial-up line modem for remote maintenance of systems with USB interface
– 5 V DC supply via USB interface

All devices feature:
a) For interference-proof operation, including under harsh EMI conditions:
– High-quality electrical isolation
– Integrated surge protection
b) Comprehensive security functions that prevent unauthorized access by means of
– Configurable, selective call acceptance
– Connection establishment with password protection
– Callback function

Notes:
1) EMC: Class A product, see page 553

Ethernet

Modem for dial-up operation with Ethernet connection (LAN)

Technical data

Supply		
Supply voltage		10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		-
Supply voltage		24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		< 100 mA (24 V DC)
Stand-by current consumption		< 70 mA
Serial port		
Connection method		RJ45 socket, shielded
Data format/coding		-
Data flow control/protocols		TCP/IP, UDP, TFTP, HTTP, Modbus TCP, PPP, PROFINET, EtherNet IP, CHAP
Transmission speed		10/100 Mbps, autonegotiation
PSTN port (a/b line)		
Connection method		RJ12, 6-pos.
Dialing procedure		Multiple frequency/pulse dialing, configuration via software
Input/output		
Switching input		-
Switching output		-
General data		
Ambient temperature (operation)		0 °C ... 55 °C
Electrical isolation		(VCC // PSTN // Ethernet)
Test voltage		1.5 kV
Approvals for countries		EU, USA, Canada, other countries in preparation
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC
Dimensions	W / H / D	45 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial, analog Ethernet modem, Scope of supply: modem, RJ12/RJ12 cable, TAE adapter	**PSI-MODEM/ETH[1])**	**2313300**	1
Industrial analog modem, scope of delivery: modem, CD with configuration software, manual and RJ12/RJ12 cable			
Industrial analog modem with USB connection, scope of supply: modem, driver CD with manual, USB cable and RJ12/RJ12 cable			

Accessories

System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
MPI adapter for coupling to the programming interface of a Siemens SIMATIC® S7-300/400 controller			
Interface converter for switching between two RS-232 interfaces			
RS-232-D-SUB cable, length: 2 m			
RS-232-D-SUB cable, length: 0.5 m			

RS-232

Modem for dial-up/permanent line operation With V.24 (RS-232) connection and 1 DI/DO

Ex:

Technical data	
10 V DC ... 60 V DC (via plug-in COMBICON screw terminal block)	
16 V AC ... 40 V AC (via plug-in COMBICON screw terminal block)	
24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	
< 100 mA (24 V DC) < 40 mA	
D-SUB-9 plug	
Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length	
Software handshake, Xon/Xoff, direct mode or hardware handshake RTS/CTS	
Automatic data rate detection (default) or fixed setting to 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps, can be set via software	
RJ12, 6-pos., or plug-in COMBICON screw terminal block	
Multiple frequency/pulse dialing, configuration via software	
U_{Nom} 24 V DC / 5 mA, input range 9...48 V DC, floating	
Miniature switching relay 60 V DC / 1 A ; 42 V AC / 1 A, N/O contact	
0 °C ... 55 °C (VCC // PSTN // V.24 (RS-232)) 1.5 kV EU, USA, Canada, Australia, other countries in preparation	
Conformance with EMC Directive 2004/108/EC 35 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-DATA/FAX-MODEM/RS232	**2708203**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
PSI-MPI/RS232-PC	**2313148**	1
PSI-MODEM-SPLITTER	**2708766**	1
PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA9SUB9/BB/0,5METER	**2708520**	1

RS-232

Modem for dial-up operation with V.24 (RS-232) connection

Ex:

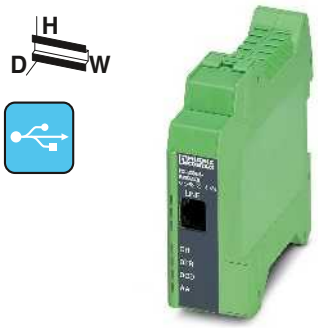
Technical data	
10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
-	
24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	
< 100 mA (24 V DC) < 40 mA	
D-SUB-9 plug	
Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length	
Software handshake, Xon/Xoff or hardware handshake RTS/CTS	
Automatic data rate detection 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bits/s	
RJ12, 6-pos.	
Multiple frequency/pulse dialing, configuration via software	
-	
-	
0 °C ... 55 °C (VCC // PSTN // V.24 (RS-232)) 1.5 kV EU, USA, Canada, other countries in preparation	
Conformance with EMC Directive 2004/108/EC 22.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-DATA/BASIC-MODEM/RS232[1])	**2313067**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
PSI-MPI/RS232-PC	**2313148**	1
PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA9SUB9/BB/0,5METER	**2708520**	1



Modem for dial-up operation with USB connection

Technical data	
-	
-	
5 V DC (via mini USB type B)	
< 100 mA (for 5 V DC, nominal operation) < 40 mA (for 5 V DC, sleep mode)	
Mini USB type B	
-	
-	
-	
RJ12, 6-pos.	
Multiple frequency/pulse dialing, configuration via software	
-	
-	
0 °C ... 55 °C (PSTN // USB) 1.5 kV EU, USA, Canada, other countries in preparation	
Conformance with EMC Directive 2004/108/EC 22.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MODEM-BASIC/USB[1])	**2313436**	1

Accessories

Private network/ extender

Notes:
1) EMC: Class A product, see page 553

Network devices that are up to 20 km away from each other via existing copper cables, e.g., using in-house telephone lines. Special Ethernet or fiberglass cables are not required.

Ethernet:
– Plug and play
– Distances up to 20 km
– Data rates of up to 30 Mbps (4-wire)
– Data rates of up to 15.3 Mbps (2-wire)
– Robust modulation method (SHDSL)
– Via in-house cables, not via the public telephone network
Ethernet interface:
– Plug and play
– No IP configuration required
– Protocol transparent (IPv4 and IPv6)
– RSTP (Rapid Spanning Tree Protocol) support
– PROFINET (strict priority)

Topologies:
– Point-to-point
– Line structure
– Ring structure
– Redundancy operation

Additional features:
– Two digital outputs for status transmission
– Configuration software for extended functionality
– Online diagnostics
– Logbook function
– Saving and printing of project and device configurations

PROFIBUS:
– Distances up to 20 km
– Data rates of up to 1.5 Mbps (point-to-point)
– Data rates of up to 500 kbps (line structure - up to 30 devices)
– Via in-house cables, not via the public telephone network
– Robust modulation method (SHDSL)
– Redundancy operation supported
Configuration software
– Easy, guided configuration
– Calculation of the maximum PROFIBUS data rate
– Calculation of the slot time
– Online diagnostics
– Mixed operation of copper cables and fiber optics

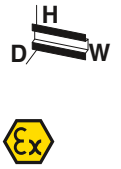
RS-232/RS-422/RS-485:
– RS-232 interface (9-pos. D-SUB):
Data rates of up to 230.4 kbps
– Automatic DCE/DTE switchover
– RS-422/RS-485 W2 interface (COMBICON plug):
Data rates of up to 2000 kbps
– Termination resistor, can be enabled/disabled (RS-485 W2)

Additional information can be found in the relevant data sheets/user manuals.

Supply	
Supply voltage	
Supply voltage	
Nominal current consumption	
V.24 (RS-232) interface	
Connection method	
Transmission speed	
RS-422 interface	
Connection method	
Transmission speed	
RS-485 interface	
Connection method	
Transmission speed	
Ethernet interface	
Connection method	
Transmission speed	
SHDSL interface	
Connection method	
Transmission speed	
USB interface	
Connection method	
Transmission length	
Functions	
Management	
Input/output	
Switching output	
General data	
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Electromagnetic compatibility	
Dimensions	W / H / D

Description
SHDSL permanent line modem, for point-to-point, linear, and star structures on in-house 2- and 4-wire cables
System power supply unit, primary-switched
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DATATRAB, surge protection for two signal pairs of the analog and digital (DSL) telecommunication interface

Ethernet extender



Serial extender

PROFIBUS extender

Ex:

Ex:

Ex:

Technical data	Technical data	Technical data
18 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 30 V DC
24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
< 180 mA (24 V DC)	< 180 mA (24 V DC)	< 180 mA (24 V DC)
-	D-SUB-9 plug	-
-	0.11/0.3/1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2/230.4 kbps, NRZ	-
	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
-	Plug-in/screw connection via COMBICON	-
-	1.2/2.4/4.8/7.0/9.6/19.2/38.4/57.6/75/93.75/115.2/136/187.5/375/500/1500/2000 kbps, NRZ	-
	RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire	PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control
-	Plug-in/screw connection via COMBICON	D-SUB-9 socket
-	1.2/2.4/4.8/7.0/9.6/19.2/38.4/57.6/75/93.75/115.2/136/187.5/375/500/1500/2000 kbps, NRZ	9.6/19.2/45.45/93.75/187.5/500/1500 kbps, set via configuration software
RJ45 socket, shielded	-	-
10/100 Mbps, autonegotiation	-	-
SHDSL interface according to ITU-T G.991.2.bis	SHDSL interface according to ITU-T G.991.2.bis	SHDSL interface according to ITU-T G.991.2.bis
2 x 2-pos. COMBICON plug-in screw terminal blocks	2 x 2-pos. COMBICON plug-in screw terminal blocks	2 x 2-pos. COMBICON plug-in screw terminal blocks
4-wire operation: 64 kbps ... 30 Mbps	4-wire operation: 64 kbps ... 30 Mbps	4-wire operation: 64 kbps ... 30 Mbps
2-wire operation: 32 kbps ... 15.3 Mbps	2-wire operation: 32 kbps ... 15.3 Mbps	2-wire operation: 32 kbps ... 15.3 Mbps
USB 2.0	USB 2.0	USB 2.0
Mini-USB type B, 5-pos.	Mini-USB type B, 5-pos.	Mini-USB type B, 5-pos.
max. 5 m (only for configuration and diagnostics)	max. 5 m (only for configuration and diagnostics)	max. 5 m (Only for configuration and diagnostics)
Plug and play, user-friendly software: diagnostic functions, log book, individual configuration	User-friendly software: guided configuration, plausibility checks, diagnostic functions, log book	User-friendly software: guided configuration, plausibility checks, diagnostic functions, log book
2 x U_{Nom}/150 mA (the digital outputs cannot be used for power supply via the TBUS), short-circuit-proof	2 x U_{Nom}/150 mA (the digital outputs cannot be used for power supply via the TBUS), short-circuit-proof	2 x U_{Nom}/150 mA (the digital outputs cannot be used for power supply via the TBUS), short-circuit-proof
-20 °C ... 60 °C (freestanding (40 mm spacing to the right and left), no supply of other modules via the device)	-20 °C ... 60 °C (for derating, see technical documentation)	-20 °C ... 60 °C (for derating, see technical documentation)
DIN EN 50178 (VCC // Ethernet // DSL (A) // DSL (B))	DIN EN 50178 (VCC // RS-422, RS-485 // DSL Port A // DSL Port B // FE)	DIN EN 50178 (VCC // PROFIBUS // DSL (A) // DSL (B))
1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
35 mm / 99 mm / 114.5 mm	35 mm / 99 mm / 114.5 mm	35 mm / 99 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MODEM-SHDSL/ETH[1])	**2313643**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
DT-TELE-RJ45	**2882925**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MODEM-SHDSL/SERIAL[1])	**2313669**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
DT-TELE-RJ45	**2882925**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MODEM-SHDSL/PB[1])	**2313656**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
DT-TELE-RJ45	**2882925**	1

Antennas

The PSI-GSM/UMTS-ANT-OMNI-2-5 and PSI-GSM/UMTS-QB-ANT multiband antenna are suitable for GSM networks operating at 850 MHz, 900 MHz, 1800 MHz, and 1900 MHz, as well as for UMTS networks.

The PSI-GSM/UMTS-ANT-OMNI-2-5 antenna is suitable for external panel and external mast mounting. The PSI-GSM/UMTS-QB-ANT antenna is ideal for mounting on a control cabinet or control box.

External antenna

Control cabinet antenna

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Multiband antenna for external panel and external mast mounting for UMTS and quad-band GSM, with omnidirectional characteristics, 5 m antenna cable with SMA round connector	PSI-GSM/UMTS-ANT-OMNI-2-5	2900982	1			
Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm				PSI-GSM/UMTS-QB-ANT	2313371	1

Antenna extension cables and surge protection

The 5 m and 10 m long antenna extension cables allow greater flexibility when installing antennas. The surge protection is suitable for GSM networks operating at 850 MHz, 900 MHz, 1800 MHz, and 1900 MHz, as well as for UMTS networks.

Antenna extension cable

Protective adapter set with SMA connection, grounded shield

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Antenna extension cable for UMTS and quad-band GSM, 5 m long, antenna cable with SMA connector and SMA coupling	PSI-CAB-GSM/UMTS- 5M	2900980	1			
Antenna extension cable for UMTS and quad-band GSM, 10 m long, antenna cable with SMA connector and SMA coupling	PSI-CAB-GSM/UMTS-10M	2900981	1			
Surge protection for UMTS and quad-band GSM antenna, with SMA connector and SMA coupling				CSMA-LAMBDA/4-2.0-BS-SET	2800491	1

Programming adapter

The MPI adapter makes it possible to convert a V.24 (RS-232) interface to the MPI bus (19.2 or 187.5 kbps). It is used to couple modems, Bluetooth converters, and FL COM servers to the programming interface of a Siemens SIMATIC®S7 300/400 controller.

Programming adapter

Programming set

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
MPI adapter for coupling to the programming interface of a Siemens SIMATIC® S7-300/400 controller	PSI-MPI/RS232-PC	2313148	1			
Programming set, for remote monitoring of Siemens-SIMATIC® S7-300/400 controllers, consisting of pre-configured analog modem, RS-232 cable, and MPI adapter				PSI-MODEM-MPI-SET1	2313261	1

Interface converter and SHDSL surge protection

Interface converter

Makes it possible to switch over to a second terminal device with a V.24 (RS-232) interface.

SHDSL surge protection

Surge protection for broadband communication devices.

Interface converter

SHDSL surge protection

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Interface converter for switching between two RS-232 interfaces	PSI-MODEM-SPLITTER	2708766	1			
RS-232 flat-ribbon connecting cable between the modem and the PSI-MODEM-SPLITTER	PSI-CA-MODEM-SPLITTER	2311425	1			
DATATRAB, surge protection for two signal pairs of the analog and digital (DSL) telecommunication interface				DT-TELE-RJ45	2882925	1

INTERBUS PC master/slave controller boards

Generation 4 master controller boards from Phoenix Contact are intelligent solutions for connecting INTERBUS systems. They feature a compatible structure:
– Compatible driver
– Parameterization and diagnostics with Diag+
– Access to high-level language applications via HFI
– Direct integration in OPC-based visualization systems via OPC server

The slave controller boards are plug-in boards which integrate a PC in an INTERBUS system as a remote bus device.

Features:
– Access to INTERBUS system data and controller data via visualization stations
– Installation of several boards in a PC with monitoring of multiple INTERBUS lines
– Number of data words can range from 1 to 24
– INTERBUS parameter channel (PCP) supported
– External 24 V DC power supply

Notes:
1) EMC: Class A product, see page 553

PCI master

Technical data

Interfaces	
Host system	PCI bus, 32 bit, 33 MHz, 5 V
INTERBUS remote bus	9-pos. D-SUB socket strip, with electrical isolation
INTERBUS remote bus, incoming	-
Parameterization/operation/diagnostics	RS-232-C, Mini-DIN socket
Direct I/Os	14-pos. FLK pin strip
INTERBUS master	
Number of devices with parameter channel (PCP)	max. 126 (512 words)
Number of I/O nodes	max. 8192
Number of supported devices	max. 512 (of which 254 are remote bus devices/bus segments)
INTERBUS slave	
Amount of process data	-
Supported transmission speed	-
Direct I/Os	
Number of inputs	6
Number of outputs	2
Software interfaces	
Software driver	Windows NT / Windows 2000 / Windows XP / Windows 7 / Venturcom RTX 5.x / further types on request
Application interface	HFI OPC DDI
Power supply	
Power supply connection	Via PCI bus
Supply voltage	5 V DC
Supply voltage range	± 5% (including ripple)
Typical current consumption	0.7 A
General data	
Weight	150 g
Format	Short plug-in card, 1-slot
Ambient temperature (operation)	0 °C ... 55 °C (in acc. with EN 60204-1)
Ambient temperature (storage/transport)	-25 °C ... 75 °C (in acc. with EN 60204-1)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PC controller board			
	IBS PCI SC/I-T[1])	**2725260**	1
Slave controller board, with external voltage supply - Copper connection - Fiber optics connection			

Accessories

Diag+ full version, for INTERBUS diagnostics (ActiveX Control with programming interface)	**DIAG+**	**2730307**	1
INTERBUS OPC server, data interface between distributed INTERBUS and Ethernet networks and visualization systems	**IBS OPC SERVER**	**2729127**	1

PCI slave

PCI/104 master

PC/104 master

Technical data

IBS PCI RI/I-T[1])	IBS PCI RI-LK[1])
PCI slot in acc. with PCI specification 2.1 or higher, PCI bus, 32 bits, 33 MHz, 3.3/5 V	
9-pos. D-SUB socket strip	FSMA plugs
9-pos. D-SUB pin strip	FSMA plugs
-	
-	
-	
-	
Max. 24 data words	
500 kbps / 2Mbps (can be switched)	
-	
-	
Windows NT / Windows 2000 / Windows XP	
DDI OPC-DA server	
Via PCI bus or 2-pos. MINI-COMBICON	
3.3 V DC (internal) 5 V DC (internal) 24 V DC (external)	
18 V DC ... 30 V DC	
1 A	
130 g	
Short plug-in card, 1-slot	
0 °C ... 55 °C	
-20 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS PCI RI/I-T[1])	**2730129**	1
IBS PCI RI-LK[1])	**2704045**	1

Accessories

DIAG+	**2730307**	1
IBS OPC SERVER	**2729127**	1

Technical data

PCI-104 bus, 32 bits, 33 MHz, 5 V
10-pos. DIL pin strip
-
RS-232-C, 10-pos. DIL pin strip
-
max. 126 (512 words)
max. 8192
max. 512 (of which 254 are remote bus devices/bus segments)
-
-
-
-
Windows NT / Windows 2000 / Windows XP / Venturcom RTX 5.x / further types on request
HFI OPC DDI
Via PCI-104 bus
5 V DC
± 5% (including ripple)
0.7 A
80 g
PCI-104
0 °C ... 55 °C (in acc. with EN 60204-1)
-25 °C ... 75 °C (in acc. with EN 60204-1)

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS PCI 104 SC-T[1])	**2737494**	1

Accessories

DIAG+	**2730307**	1
IBS OPC SERVER	**2729127**	1

Technical data

PC-104 bus
10-pos. DIL pin strip
-
RS-232-C, 10-pos. DIL pin strip
-
max. 62 (512 words)
max. 8192
max. 512 (of which 254 are remote bus devices/bus segments)
-
-
-
-
Windows NT / Windows 2000 / Windows 95/98 / DOS / further types on request
OPC DDI
Via PC/104 bus
5 V DC
± 5% (including ripple)
0.4 A
80 g
PC/104
0 °C ... 55 °C (in acc. with EN 60204-1)
-25 °C ... 75 °C (in acc. with EN 60204-1)

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS PC 104 SC-T[1])	**2721701**	1

Accessories

DIAG+	**2730307**	1
IBS OPC SERVER	**2729127**	1

INTERBUS master controller boards for Simatic S7-300/400

INTERBUS master controller boards enable INTERBUS to be used as the fieldbus directly at the SIMATIC S7-300/400 controller.

The boards can easily read in INTERBUS and start it directly or parameterize it with the Config+ software.

The IBS S7 400 ETH DSC/I-T board enables direct access to INTERBUS from an Ethernet network, without having to route the information through the control program.

A STEP 7 block library is available for positioning tasks, drives, and other tasks.

Features:

– INTERBUS with up to 8192 I/O points per controller board
– Maximum INTERBUS transmission speed of 2 Mbaud
– Blocks for STEP 7 simplify integration

Notes:

1) EMC: Class A product, see page 553

INTERBUS master for S7-300 systems

Technical data

Interfaces	
Control system	SIMATIC® S7-300 I/O bus
INTERBUS remote bus	9-pos. D-SUB socket strip
Ethernet	-
Parameterization/operation/diagnostics	RS-232-C, D-SUB plug
INTERBUS master	
Number of possible parameter channels	-
Number of I/O nodes	max. 8192
Number of supported devices	max. 512 (of which 254 are remote bus devices/bus segments)
Supported transmission speed	500 kbps / 2 Mbps
Software interfaces	
Application interface	S7 I/O driver S7 function blocks
Programming tool	STEP 7 from version 5.x
Power supply	
Power supply connection	External power supply
Supply voltage	24 V DC
Typical current consumption	-
General data	
Weight	500 g
Format	1 slot
Width	80 mm
Height	125 mm
Depth	110 mm
Ambient temperature (operation)	0 °C ... 60 °C (0°C to 40°C (vertical installation))
Ambient temperature (storage/transport)	-25 °C ... 65 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Controller board for Siemens SIMATIC® controllers - S7-300 - S7-400	**IBS S7 300 DSC-T[1])**	**2719975**	1

Accessories

Config + full version for configuration and diagnosis of networks	**CONFIG+**	**2868059**	1
Diag+ full version, for INTERBUS diagnostics (ActiveX Control with programming interface)	**DIAG+**	**2730307**	1
Programming cable, to connect the controller boards to the PC (V.24 (RS-232-C)), length 3 m	**IBS PRG CAB**	**2806862**	1
Program and configuration memory - 2 MB	**IBS MC FLASH 2MB**	**2729389**	1

INTERBUS master for S7-400 systems

INTERBUS master for S7-400 systems with Ethernet interface

Technical data

SIMATIC® S7-400 P bus	
9-pos. D-SUB socket strip	
-	
RS-232-C, D-SUB plug	
-	
max. 8192	
max. 512 (of which 254 are remote bus devices/bus segments)	
500 kbps / 2 Mbps	
S7 I/O driver	
S7 function blocks	
STEP 7 from version 5.x	
Via SIMATIC I/O bus	
5 V DC	
0.9 A	
800 g	
2 slots	
50 mm	
290 mm	
210 mm	
0 °C ... 60 °C	
-25 °C ... 65 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS S7 400 DSC/I-T[1])	**2719962**	1

Accessories

CONFIG+	**2868059**	1
DIAG+	**2730307**	1
IBS PRG CAB	**2806862**	1
IBS MC FLASH 2MB	**2729389**	1

Technical data

SIMATIC® S7-400 P bus	
9-pos. D-SUB socket strip	
10/100Base-T via RJ45	
RS-232-C, D-SUB plug	
-	
max. 8192	
max. 512 (of which 254 are remote bus devices/bus segments)	
500 kbps / 2 Mbps	
S7 I/O driver	
S7 function blocks	
STEP 7 from version 5.x	
Via SIMATIC I/O bus	
5 V DC	
2.5 A	
1200 g	
2 slots	
50 mm	
290 mm	
210 mm	
0 °C ... 60 °C	
-25 °C ... 65 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS S7 400 ETH DSC/I-T[1])	**2731102**	1

Accessories

CONFIG+	**2868059**	1
DIAG+	**2730307**	1
IBS PRG CAB	**2806862**	1
IBS MC FLASH 2MB	**2729389**	1

SUBCON.../SUBCON-PLUS...
D-SUB fast connection connector

Convenient connection technology

An idea has taken hold - absolutely no soldering or crimping tools: the SUBCON... D-SUB connectors can be connected quickly and conveniently in field conditions. The connector contacts are clearly routed onto consecutively numbered screw terminal blocks. This means clarity during wiring and it simplifies every startup.

High EMI shielding effect

The SUBCON... connector range, trimmed to the smallest dimensions, provides a high level of shielding against EMI influences in industrial environments by virtue of its metallic housing.

Optional cable infeed

The connection block can be inserted in either the upper or lower shell. This allows the cable to be fed in at 0° to 90° from right or left.

This allows on-site configuration of the cable infeed and requires only an order number with the order.

A wide product range

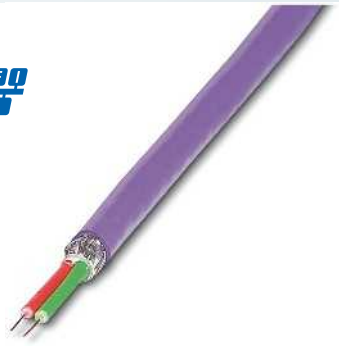
Irrespective of whether the application requires 9, 15 or 25-pos. connectors with one or two cable entries for point-to-point or RS-485 bus connections, a suitable version is available for each and every application. Optimized designs for PROFIBUS, CANopen® and SafetyBUSp with the right cables and tools complete the comprehensive range.

Customer-specific solutions

Does your application need an exclusive solution? We would be pleased to provide you with an offer using our know-how. Of course, space can be made for your own company logo in the plastic parts.

PROFIBUS cables and fast connection tools for SUBCON-PLUS-PROFIBUS

If the Fast Connect PSM-CABLE-PROFIB/FC cable is used, work is reduced to a minimum by using the quick stripping tool, **PSM-STRIP-FC/PROFIB**:
– Strip cables and single wires
– Insert them into the connector, and
– Close the housing cover.

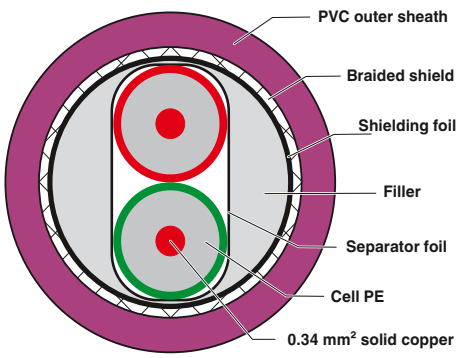


PROFIBUS cable, type Fast Connect

Quick stripping tool for SUBCON-PLUS-PROFIBUS connectors

	Technical data	Technical data
Cable cross section (max./min.)	8.4 mm / 7.6 mm	-
Ambient temperature (operation)	-40 °C ... 60 °C	-
Loop resistance	≤ 110 Ω (per kilometer)	-
Working capacitance	28.5 nF (per kilometer)	-
Wave impedance	150 Ω ±15%	-
Conductor	Solid copper wire, bare	-
Cross section	0.34 mm² / AWG 22	-
Outer sheath, material	PVC FR VI	-
External sheath, color	Violet	-
Behavior in fire	Flame-resistant as per IEEE and IEC 60 332-3 test type C	-
Resistance to oil	Limited resistance to mineral oils and greases	-
Cable type	PROFIBUS in acc. with IEC 61158, Type A	-
Operations per knife block	-	PUR cable: max. 300 per knife block PVC cable: max. 3000 per knife block

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
PROFIBUS cable, Fast Connect type, up to 12 Mbps, for permanent connection (02YSY (ST)CY 1X2X22 AWG) (Length in meters as per customer specifications)	PSM-CABLE-PROFIB/FC	2744652	1			
Quick stripping tool for PROFIBUS cable, Fast Connect type				PSM-STRIP-FC/PROFIB	2744623	1
	Accessories			**Accessories**		
Spare knife block for quick stripping tool blue				PSM-STRIP-KNIFEBLOCK	2744636	1
Stripping tool, for conductors and cables black	QUICK WIREFOX 6	1204384	1	QUICK WIREFOX 6	1204384	1



SUBCON-PLUS-PROFIBUS
D-SUB fast connection

PROFIBUS connectors with fast connection

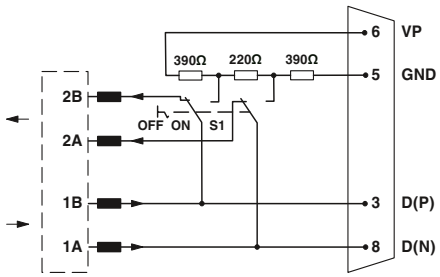
The SUBCON-PLUS-PROFIB/... and D-UFB-PB D-SUB series have been specially designed for use in PROFIBUS systems up to 12 Mbps. Under field conditions, they allow convenient and fast connection of the incoming and outgoing bus cable. The series includes six fast connection connectors - the perfect solution for every PROFIBUS application:

– 35° and 90° angled cable entry
– Axial cable entry
– With an additional programming interface
– Integrated surge protection

The connectors can be used for PROFIBUS cables with solid as well as with stranded copper wires (…FC 90 only for solid conductors. For permissible cable types, see the data sheet). The terminating resistor is already integrated in all versions. It can be connected externally by means of a slide switch. At the same time, the outgoing bus segment is switched off. This makes it easy to start up segment by segment while incorrect terminations are avoided. In addition, the connector housing with high-quality shielding guarantees high immunity to interference even at maximum transmission speeds. A special feature of the 35° angled connector is that the internal connection unit can be turned round. Whether the cable is to be inserted from the right or left can therefore be decided on-site. If it is not possible to use the angled version, the SUBCON-PLUS.../AX compact connector with axial cable entry can be used instead. The connectors have been designed for all standard PROFIBUS cables with an outside diameter of 8 mm (type A and B).

Notes:

A 35° plug with built-in surge protection can be found under designation D-UFB-PB in Catalog 6 or at www.phoenixcontact.net/products.



Functional diagram of the connector range SUBCON-PLUS-PROFIB/...

35° PROFIBUS connector, screw connection, reversible cable entry

Technical data

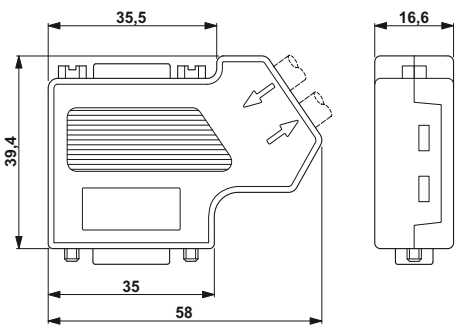
Cable entry	35° (right or left)
Pin assignment	3, 5, 6, 8
Connection cross section (solid/stranded/AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	8.4 mm / 7.6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP40
Housing material	ABS, metal-plated
Termination resistor	390 Ω - 220 Ω - 390 Ω (switchable)
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PROFIBUS connector, up to 12 Mbps, integrated termination resistor which can be activated externally, 9-pos. pin, pin assignment 3, 5, 6, 8			
- Angled 35°, screw connection	**SUBCON-PLUS-PROFIB/SC2**	**2708232**	1
- Angled 35°, screw connection with second D-SUB socket	**SUBCON-PLUS-PROFIB/PG/SC2**	**2708245**	1
- Angled 90°, screw connection			
- Angled 90°, screw connection with second 9-pos. D-SUB socket			
- Angled 90°, IDC connection			
- Angled 90°, IDC connection with second 9-pos. D-SUB socket			
- Axial cable entry, screw connection			

Accessories

PROFIBUS cable, Fast Connect type, up to 12 Mbps, for permanent connection (02YSY (ST)CY 1X2X22 AWG) (Length in meters as per customer specifications)		
Quick stripping tool for PROFIBUS cable, Fast Connect type	**PSM-CABLE-PROFIB/FC**	**2744652** 1
Stripping tool, for conductors and cables	**PSM-STRIP-FC/PROFIB**	**2744623** 1
Screwdriver	**QUICK WIREFOX 6**	**1204384** 1
Screwdriver	**SZK PH1 VDE**	**1205150** 10
	SZF 0-0,4X2,5	**1204504** 10



90° PROFIBUS connector, screw connection

90° PROFIBUS connector, IDC insulation displacement connection method

Axial PROFIBUS connector, screw connection

Technical data

	90° (left)
	3, 5, 6, 8
	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
	> 200
	8.4 mm / 7.6 mm
	-20 °C ... 75 °C
	IP40
	ABS, metal-plated
	390 Ω - 220 Ω - 390 Ω (switchable)
	4-40 UNC 0.4 Nm

Ordering data

Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-PROFIB/90/SC	2313698	1
SUBCON-PLUS-PROFIB/90/PG/SC	2313708	1

Accessories

PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1
QUICK WIREFOX 6	1204384	1
SZK PH1 VDE	1205150	10

Technical data

	90° (left)
	3, 5, 6, 8
	0.32 - 1 mm² / 0.32 - 1 mm² / 22 - 18
	> 200
	8.4 mm / 7.6 mm
	-20 °C ... 75 °C
	IP40
	ABS, metal-plated
	390 Ω - 220 Ω - 390 Ω (switchable)
	4-40 UNC 0.4 Nm

Ordering data

Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-PROFIB/90/IDC	2313672	1
SUBCON-PLUS-PROFIB/90/PG/IDC	2313685	1

Accessories

PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1
QUICK WIREFOX 6	1204384	1
SZK PH1 VDE	1205150	10

Technical data

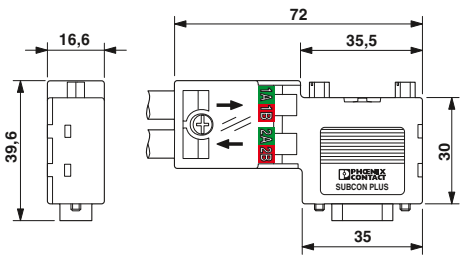
	180° (axial)
	3, 5, 6, 8
	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
	> 200
	8.4 mm / 7.6 mm
	-20 °C ... 75 °C
	IP40
	ABS, metal-plated
	390 Ω - 220 Ω - 390 Ω (switchable)
	4-40 UNC 0.4 Nm

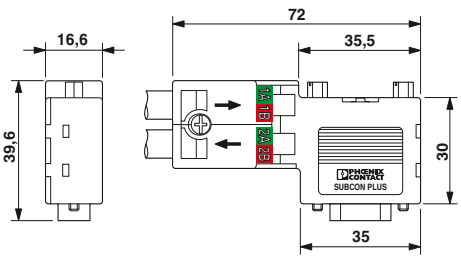
Ordering data

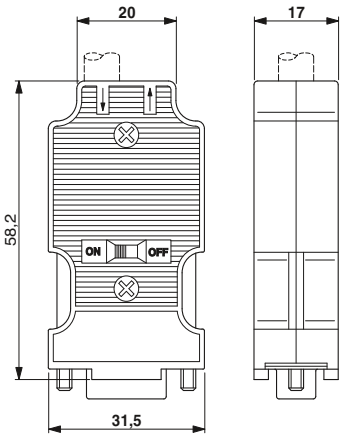
Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-PROFIB/AX/SC	2744380	1

Accessories

PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1
QUICK WIREFOX 6	1204384	1
SZK PH1 VDE	1205150	10
SZF 0-0,4X2,5	1204504	10







SUBCON-PLUS-CAN
D-SUB fast connection connector

The SUBCON-PLUS-CAN/... D-SUB series is specially designed for use in CAN systems. Under field conditions, it enables the quick and easy connection of the incoming and outgoing bus cable.

The terminating resistor is already integrated in all versions. It can be connected externally by means of a slide switch. At the same time, the outgoing bus segment is switched off. This makes it easy to start up segment by segment while incorrect terminations are avoided. In addition, the connector housing with high-quality shielding guarantees high immunity to interference even at maximum transmission speeds.

A special feature of the angled plug is that the internal connection unit can be turned round. Whether the cable is to be inserted from the right or left can therefore be decided on-site. If it is not possible to use the angled design, a compact connector with axial cable entry is available with the SUBCON-PLUS-CAN/AX type.

Features:

– Assembly under field conditions
– Separate terminal blocks for bus cables
– Termination resistor can be connected
– Segment-by-segment startup
– High transmission speed
– High level of EMC
– Flexibility in terms of cable entry selection
– Suitable for bus cables as per the CiA Draft Recommendation 303-1 with an outside diameter of 8 mm
– For special cables, there is a version with a variable cable entry

Versions:

– Angled with programming interface
– Angled without programming interface
– Axial cable entry

35° D-SUB connector (socket), screw connection, two cable entries

Technical data

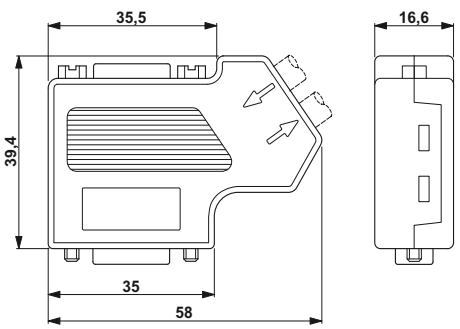
Cable entry	35° (right or left)
Pin assignment	2, 3, 7, 9
Nominal voltage U_N	50 V
Nominal current I_N	100 mA
Connection cross section (solid/stranded/AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	8.4 mm / 7.6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP40
Housing material	ABS, metal-plated
Termination resistor	120 Ω (can be connected externally)
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
CAN, CANopen®, SafetyBUS p connector, integrated termination resistor that can be activated from the outside, with screw connection, 9-pos., socket			
- Angled 35°	**SUBCON-PLUS-CAN/SC2**	**2708999**	1
- Angled 35°, with second D-SUB connection	**SUBCON-PLUS-CAN/PG**	**2708119**	1
- Angled 35°, for variable cable diameters			
CAN, CANopen®, SafetyBUS p connector, integrated termination resistor that can be activated from the outside, with screw connection, 9-pos., socket			
- Axial cable entry			

Accessories

Screwdriver	**SZS 0,4X2,5 VDE**	**1205037**	10



35° D-SUB connector (socket), variable cable diameter

Axial D-SUB connector (socket), two cable entries

Technical data

	35° (right or left)
	2,3,7
	50 V
	100 mA
	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
	> 200
	10 mm / 6 mm
	-20 °C ... 75 °C
	IP40
	ABS, metal-plated
	120 Ω (can be connected externally)
	4-40 UNC 0.4 Nm

Ordering data

Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-CAN	2744694	1

Accessories

SZS 0,4X2,5 VDE	1205037	10

Technical data

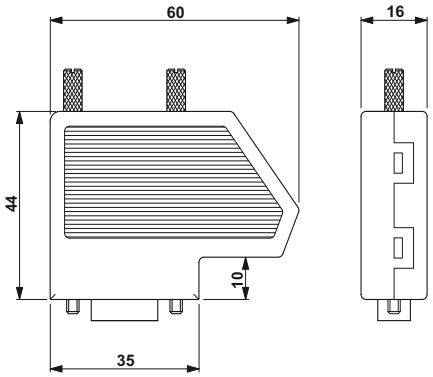
	180° (axial)
	2, 3, 7
	50 V
	100 mA
	0.14 - 0.5 mm² / 0.14 - 0.5 mm² / 26 - 20
	> 200
	8.4 mm / 7.6 mm
	-20 °C ... 75 °C
	IP40
	ABS, metal-plated
	120 Ω (can be connected externally)
	4-40 UNC 0.4 Nm

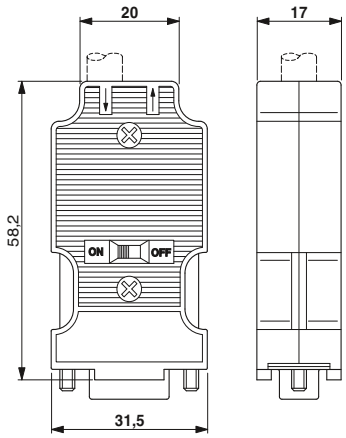
Ordering data

Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-CAN/AX	2306566	1

Accessories

SZS 0,4X2,5 VDE	1205037	10





SUBCON-PLUS
D-SUB fast connection connector

Field bus connector with screw connection

Two cable infeeds are often required on the D-SUB connectors used in order to build fieldbus systems with RS-485 interfaces. The SUBCON-PLUS connectors range fulfills this requirement and routes the connection to screw terminal blocks – however, duplicated – for two cables. This means clarity during wiring and it simplifies every startup. These connectors are of course also shielded against EMI influences with a metallized housing. In addition, by placing the connection block in either the upper or lower shell, it is possible to select the cable infeed on site from the right or left.

Features:

– For universal use
– Assembly under field conditions
– Separate terminal blocks for each cable
– High transmission speed
– High level of EMC
– Flexibility in terms of cable entry selection
– Straightforward assembly thanks to knurled screws

Versions:

– Bus-specific types with matching partial assignment
– Universal type with full assignment
– Short mounting screw as an accessory for when space is at a premium

RS-485

Modbus

With two cable entries, 35° angled and axial

Technical data

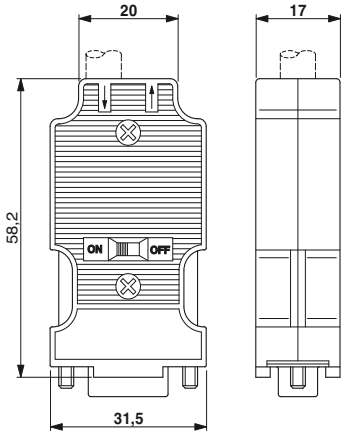
Nominal voltage U_N	50 V
Nominal current I_N	100 mA
Connection cross section (solid/stranded/AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	10 mm / 6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP20
Housing material	ABS, metal-plated
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

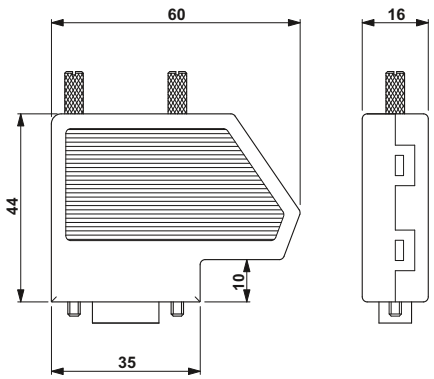
Description	Type	Order No.	Pcs. / Pkt.
D-SUB connector, with **two** cable entries for Modbus, Modbus-PLUS, BITBUS, ARCNET, MULT/MININET (B&R), SYSTEM 2003 (B&R), P-NET, pin assignment 1,2,3,5,6,8			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS M1**	**2761826**	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F1**	**2744267**	1
D-SUB connector, with **two** cable entries for SUCONET K1, K2 (EATON/Moeller), S-BUS (Saia), J-BUS (Merlin Gerin), pin assignment 2, 3, 4, 5, 7, 9			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS M2**	**2761839**	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F2**	**2799490**	1
D-SUB connector, with **two** cable entries for Modbus, CEGELEC, pin assignment 1,1,2,3,6,7			
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F5**	**2744102**	1
D-SUB connector, with **two** cable entries, **universal type**, pin assignment 1,2,3,4,5,6,7,8,9 on **every** screw terminal block			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS 9/M**	**2744018**	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS 9/F**	**2744241**	1
- Axial, 9-pos., pin	**SUBCON-PLUS-M/AX 9**	**2904467**	1
- Axial, 9-pos., socket	**SUBCON-PLUS-F/AX 9**	**2311797**	1

Accessories

Optional mounting screw, short (without knurl)	**SUBCON-SHORT-SCREW**	**2799694**	1
Screwdriver	**SZS 0,4X2,5 VDE**	**1205037**	10



Dimensional drawing SUBCON-PLUS-.../AX...



Dimensional drawing SUBCON-PLUS...

SUBCON
D-SUB fast connection connector

The 9-pos. version of the SUBCON-... connector range is not just suitable for INTERBUS, but is positively ideal. A whole host of further applications are opened up by having all the connections assigned to their own 1 mm² screw terminal block.

The range covers SUBCON connectors for point-to-point connections with a cable infeed in 9, 15 and 25-pos. pin or socket versions.

Installing the connection block either in the upper or lower shell makes it possible to introduce the cable at an angle of 0° to 90° from the right or the left. The completely metallized housing also ensures a high degree of shielding against EMI influences.

The optional SUBCON-SHORT-SCREW fastening screw is available as an accessory for narrow installation conditions. The screw is completely integrated into the housing by not having a knurl.

Features:
- For universal use
- Assembly under field conditions
- High level of EMC
- Flexibility in terms of cable entry selection
- Straightforward assembly thanks to knurled screws

Versions:
- 9-, 15-, and 25-pos. versions
- Short mounting screw as an accessory for when space is at a premium

INTERBUS

RS-232

RS-422

With one cable entry

Technical data

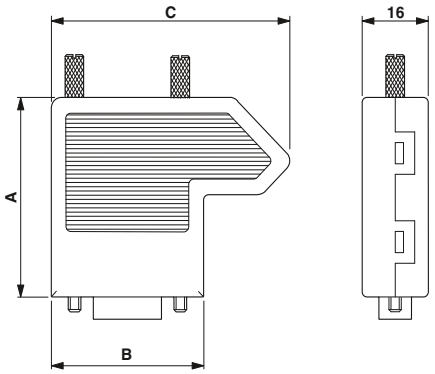
Cable entry	35° (right or left)
Pin assignment	All connections are 1:1 on the screw terminal block
Nominal voltage U_N	50 V
Nominal current I_N	100 mA
Connection cross section (solid/stranded/AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	10 mm / 4 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP20
Housing material	ABS, metal-plated
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
D-SUB connector, with screw connection			
- 9-pos., socket	**SUBCON 9/F-SH**	**2761499**	1
- 9-pos., pin	**SUBCON 9/M-SH**	**2761509**	1
D-SUB connector, with screw connection			
- 15-pos., socket	**SUBCON 15/F-SH**	**2761596**	1
- 15-pos., pin	**SUBCON 15/M-SH**	**2761606**	1
D-SUB connector, with screw connection			
- 25-pos., socket	**SUBCON 25/F-SH**	**2761619**	1
- 25-pos., pin	**SUBCON 25/M-SH**	**2761622**	1

Accessories

Optional mounting screw, short (without knurl)	**SUBCON-SHORT-SCREW**	**2799694**	1
Screwdriver	**SZS 0,4X2,5 VDE**	**1205037**	10



Dimensional drawing SUBCON...-SH

Dimensions [mm] of the D-SUB plug-in connectors (SUBCON)

	A	B	C
9-pos.	44.5	36.0	56.4
15-pos.	44.5	44.3	64.7
25-pos.	49.5	58.0	78.7

V.24 (RS-232) cables

A permanent cause of annoyance are the two connection standards, 9 and 25-pin for the RS-232 interface. The plug-in "9 to 2-pos." D-SUB adapters solve the problem without complicated resoldering of the cable connections.

The 0.5 and 2 meter standard RS-232 cables can be used to connect the rail-mountable control cabinet modules. Individual lengths can be created quickly and simply with the screw-type D-SUB plug, SUBCON.

Null modem adapter

In order to connect two RS-232 interfaces of the same type, the zero modem connector crosses the data and control lines.

Thanks to the small "Gender Changer" type, it can be plugged at any interface directly and therefore does not change the existing connector design through the socket/connector combination.

V.24 (RS-232) connecting cable

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
RS-232-D-SUB cable, length: 0.5 m - 9-pos. socket on 9-pos. socket	PSM-KA9SUB9/BB/0,5METER	2708520	1
RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 9-pos. socket	PSM-KA9SUB9/BB/2METER	2799474	1
RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 25-pos. socket	PSM-KA 9 SUB 25/BB/2METER	2761059	1

Accessories

V.24 (RS-232) null modem adapter - 9-pos. socket to 9-pos. plug	PSM-AD-D9-NULLMODEM	2708753	1
D-SUB gender changer			
- 9-pos., pin/pin	VS-09-GC-ST/ST	1652651	10
- 9-pos., socket/socket	VS-09-GC-BU/BU	1688722	10
- 25-pos., pin/pin	VS-25-GC-ST/ST	1652693	10
- 25-pos., socket/socket	VS-25-GC-BU/BU	1652680	10

USB cable adapter

Two adapter cables with a length of 1 m and 3 m are available for connecting controllers, PCs, and other automation devices with Mini-USB-B connections.

USB cable (USB-A to mini-USB)

Ordering data

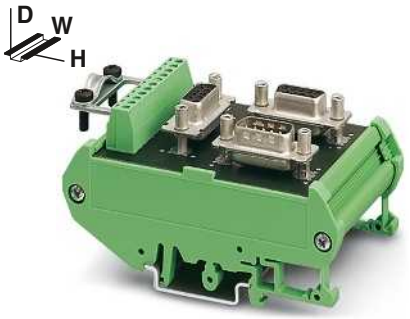
Description	Type	Order No.	Pcs. / Pkt.
USB cable, from USB-A to Mini-USB-B, 5-pos. - Length: 1 m	PSI-CA-USB A/MINI B/1METER	2313575	1
Connecting cable (single) for configuration of the PSR-TRISAFE system - Length: 3 m	CABLE-USB/MINI-USB-3,0M	2986135	1
USB cable, for diagnostics and extended configuration	RAD-CABLE-USB	2903447	1

RS-485 connection distributor

If spur connections or a star distribution are to be made in a bus system, the RS-485 connection distributors come to your aid.

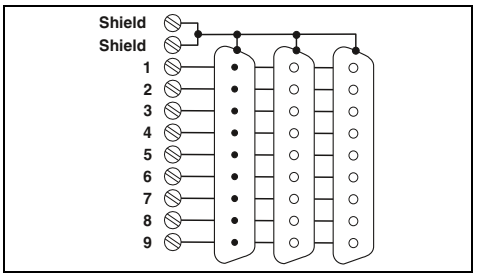
PSM-PTK, the DIN rail-mountable T-adapter equipped with three 9-pin 1:1 connected D-SUB connections, makes for clear and tidy wiring with just one spur connection.

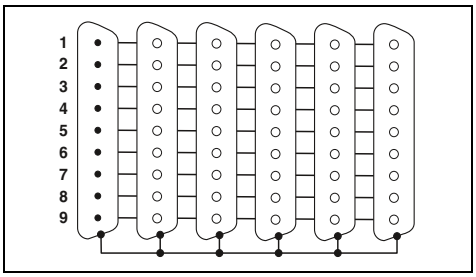
As many as four branch lines can be picked off from one bus line in the PSM-PTK 4 version. Here too, all six D-SUB connections (9-pos.) are connected through 1:1. Both versions are mounted by snapping them onto conventional EN DIN rails.



RS-485 T-distributor (4-way), D-SUB and screw connection

RS-485 T-distributor (6-way), D-SUB connection





Technical data

Plug connection	Incoming	D-SUB-9 plug	D-SUB-9 plug
	Outgoing	D-SUB-9 socket	D-SUB-9 socket
	Branching	D-SUB-9 socket	4 x D-SUB-9 socket
		1x 11-pos. PCB terminal block	-
Nominal voltage U_N		60 V AC/DC	60 V AC/DC
Nominal current I_N		1 A	1 A
Test voltage		500 V AC (50 Hz, 1 min, rms)	500 V AC (50 Hz, 1 min, rms)
Shield connection		D-SUB frame or shield connector	D-SUB frame
Screw connection	solid	0.14 mm² - 1 mm²	-
	stranded	0.14 mm² - 1.5 mm²	-
	AWG	26 - 16	-
Torque		0.4 Nm	-
Ambient temperature (operation)		-25 °C ... 70 °C	-25 °C ... 70 °C
Housing material		PVC	PVC
Pin assignment		all 1:1	all 1:1
Dimensions W / H / D		56 mm / 89.6 mm / 48 mm	89.8 mm / 89.6 mm / 39 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Passive RS-485 T-distributor, fitted with a 9 pos. D-SUB pin strip and **two** 9-pos. D-SUB socket strips, as well as a 9-pos. PCB terminal block with shield connector	**PSM PTK**	**2760623**	1
Passive RS-485 T-distributor, fitted with one 9-pos. D-SUB pin strip and **five** 9-pos. D-SUB socket strips	**PSM PTK-4**	**2799364**	1

Accessories

Screwdriver	**SZS 0,4X2,5 VDE**	**1205037**	10

Wireless I/O (2400 MHz / 900 MHz)

	Radioline 2400 MHz	Radioline 900 MHz	Radioline I/O extension modules		
Type	**RAD-2400-IFS**	**RAD-900-IFS**	**RAD-DAIO6-IFS**	**RAD-DI4-IFS/RAD-DOR4-IFS RAD-DI8-IFS/RAD-DO8-IFS**	**RAD-AI4-IFS/RAD-AO4-IFS RAD-PT100-4-IFS**
Description	**Wireless transceiver,** for serial interfaces (RS-232, RS-485), can be extended with I/O extension modules	**Wireless transceiver,** for serial interfaces (RS-232, RS-485), can be extended with I/O extension modules	**Analog/digital I/O module,** 2 digital inputs/outputs and 1 analog input/output	**Digital I/O modules,** 4 inputs or 4 relay outputs 8 inputs or 8 transistor outputs	**Analog I/O modules,** 4 inputs or 4 outputs **Temperature I/O module** 4 Pt 100 inputs
Page	**451**	**451**	**452**	**452**	**454**

Wireless IO (2400 MHz)

WirelessHART

	Wireless MUX	Fieldline I/O			
Type	**ILB BT ADIO MUX-OMNI...**	**FLM BT...**	**ILB BT ADIO 2/2/16/16**	**RAD-WHG/WLAN-XD**	**RAD-WHA-1/2NPT**
Description	**Bluetooth multiplexer,** with omnidirectional antennae	**Fieldline Modular Bluetooth base station,** with up to three Wireless I/O devices	**Inline Block,** Bluetooth device	**WirelessHART gateway**	**WirelessHART adapter**
Page	**456**	**457**	**457**	**458**	**459**

Wireless Serial (2400 MHz / 900 MHz / GPRS/GSM)

Accessories

	Radioline	PSI-WL-...Bluetooth	PSI Modem Line	2400 MHz	900 MHz
Type	**RAD-2400-IFS RAD-900-IFS**	**PSI-WL-...**	**PSM-Modem...**		
Description	**Wireless transceiver,** for serial interfaces (RS-232, RS-485), can be extended with I/O extension modules	**Bluetooth converter,** for converting RS-232 (V.24), RS-422 or RS-485 2-wire to Bluetooth wireless transmission, e.g., Modbus, PROFIBUS	**Industrial GPRS/GSM modems,** for all GMS networks (850/900/1800/1900), switching inputs and outputs, password protection	**Antennae, adapters, extension cables** for 2400 MHz products	**Antennae, adapters, extension cables** for 900 MHz products
Page	**451**	**460**	**422**	**462**	**474**

Wireless IO (900 MHz)

	RAD-Line IO unidirectional		RAD-Line serial		
Type	**RAD-ISM-900-SET-UD-ANT**	**RAD-ISM-900-SET-...UD**	**RAD-ISM-900-DATA-BD-BUS**	**RAD-ISM-900-DATA-BD**	**RAD-ISM-900-DATA-BD-PLUS**
Description	**Unidirectional wireless system,** with Trusted Wireless, transmitter and receiver in IP20 housing	**Unidirectional wireless system,** with Trusted Wireless, transmitter (IP65) and receiver (IP20)	**Wireless transceiver,** with Trusted Wireless, for serial interfaces (RS-232, RS-422/RS-485), can be extended with IO extension modules	**Wireless transceiver,** with Trusted Wireless, for serial interfaces (RS-232, RS-422/RS-485)	**Wireless transceiver,** with Trusted Wireless, for serial interfaces (RS-232, RS-422/RS-485), with integrated inputs/outputs
Page	**466**	**467**	**469**	**468**	**469**

Wireless IO (900 MHz)

	RAD-Line IO extension modules				
Type	**RAD-IN-4A-I RAD-OUT-4A-I**	**RAD-IN-8D RAD-OUT-8D-REL**	**RAD-IN+OUT-2D-1A-I**	**RAD-IN-2D-CNT RAD-OUT-2D-CNT**	
Description	**Analog module,** for four inputs or four outputs	**Digital module,** for eight inputs or eight outputs	**Analog/digital module,** for two digital inputs/outputs and one analog input/output	**Digital module,** for two counter/frequency inputs or two counter/frequency outputs	
Page	**472**	**472**	**472**	**472**	

Wireless Ethernet (900 MHz/2400 MHz)

	RAD-Line Ethernet		WLAN COM server	Industrial WLAN	Industrial Bluetooth
Type	**RAD-ISM-900-EN-BD(-BUS)**	**RAD-80211-XD-HP(-BUS)**	**FL COMSERVER WLAN 232/422/485**		
Description	**Wireless transceiver,** with Trusted Wireless, for Ethernet (900 MHz), can be extended with IO extension modules	**Wireless transceiver,** with WLAN 802.11b/g, for Ethernet (2400 MHz), can be extended with IO extension modules	**Serial device server,** for serial interfaces (RS-232, RS-422/RS-485) on Wireless LAN	For further information on Industrial WLAN, see **Section: Ethernet networks**	For further information on Industrial Bluetooth, see **Section: Ethernet networks**
Page	**470**	**471**	**413**	**48**	**52**

Easy startup with I/O mapping - the Radioline wireless system

Radioline is the new wireless system for large systems and networks. Special features include extremely easy assignment of inputs and outputs by simply turning the thumbwheel - without any programming.

Radioline transmits I/O signals as well as serial data and is therefore very versatile. In addition, you can implement various network structures: from a simple point-to-point connection to complex mesh networks.

Thanks to the latest Trusted Wireless technology, Radioline is the ideal choice for industrial use.

Network applications

– I/O data mode: simple I/O signal distribution in the network
– PLC/Modbus RTU mode: I/O integration in the control level using the Modbus protocol
– Serial data mode: networking of controllers and serial I/O devices, simple RS-232/RS-485 cable replacement

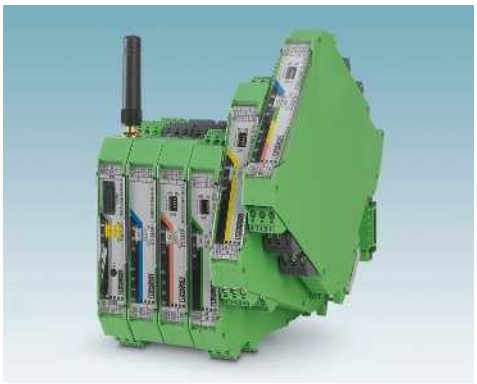
What advantages does I/O mapping offer?

I/O mapping makes it considerably easier to assign input and output signals in your systems. With a slight turn of the thumbwheel, you can distribute and multiply I/O signals freely in your network – without the need for any complex programming.

Trusted Wireless

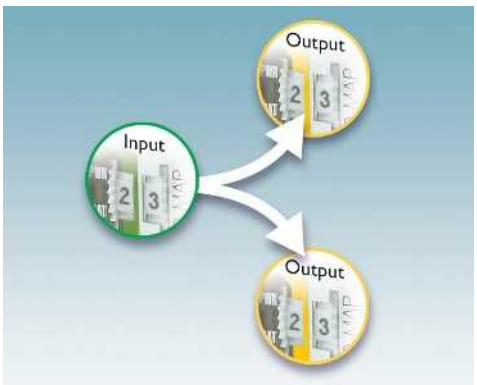
Trusted Wireless technology is specifically designed for the reliable transmission of data and signals over long distances.

The new Version 2.0 also offers functions such as adjustable data rates, encryption, extended diagnostics, and parallel operation of multiple networks.



Easy installation - Setting up, extending or replacing a wireless station in the control cabinet

Easy addressing -
Only one turn on the thumbwheel of the wireless station



Easy distribution -
Assigning inputs and outputs using the thumbwheel

N

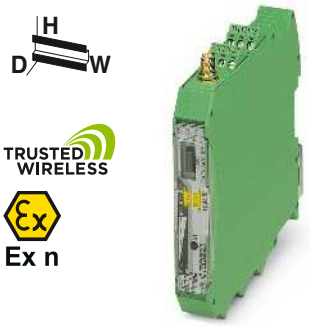
Radioline wireless modules 2.4 GHz and 900 MHz

- New Trusted Wireless 2.0 technology
- Distribute signals at the turn of a switch (I/O mapping)
- Unique network addressing via plug-in configuration memory for secure, parallel operation of multiple networks

Notes:

The latest country registrations for the relevant product can be found on the Internet at www.phoenixcontact.com.

1) EMC: Class A product, see page 553



2.4 GHz wireless transceiver, can be extended with I/O extension modules, for worldwide use

Ex:

Housing width 17.5 mm

900 MHz wireless transceiver, can be extended with I/O extension modules, for the US market

Housing width 35 mm

Technical data

Wireless path		
Direction	Bi-directional	
Frequency range	2.4002 GHz ... 2.4785 GHz	
Data rate (adjustable)	16 kbps / 125 kbps / 250 kbps	
Transmission power	max. 100 mW (adjustable)	
Number of channels	8 x 55	
Security	128-bit data encryption	
Connection method	RSMA (female)	
Serial port	RS-232	RS-485
Connection method	COMBICON plug-in screw terminal block	COMBICON plug-in screw terminal block
Serial transmission speed	0,3 ... 115,2 kbps	0,3...115,2 kbps
Termination resistor (switchable via DIP switches)	-	390 Ω / 150 Ω / 390 Ω
Analog output	RSSI voltage output	
Signal range	0 V ... 3 V	
Digital output	RF link relay output	
Contact type	PDT	
Switching voltage	30 V AC / 60 V DC	
Switching current	500 mA	
General data		
Supply voltage	19.2 V DC ... 30.5 V DC	
Current consumption	max. 65 mA (at 24 V DC, at 25°C)	
Degree of protection	IP20	
Ambient temperature range	-40 °C ... 70 °C	
Permissible humidity (operation)	20% ... 85%	
Housing material	PA 6.6-FR	
Dimensions W / H / D	17.5 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance / approvals		
Conformance	CE compliance (R&TTE directive 1999/5/EC) FCC Directive, Part 15.247 ISC Directive RSS 210	
ATEX	II 3 G Ex nA nC IIC T4 Gc X	
IECEx	Applied for	
UL, USA / Canada	UL applied for	

Technical data

Wireless path		
Direction	Bi-directional	
Frequency range	902 MHz ... 928 MHz	
Data rate (adjustable)	16 kbps / 125 kbps / 250 kbps / 500 kbps	
Transmission power	max. 1 W (adjustable)	
Number of channels	-	
Security	128-bit data encryption	
Connection method	RSMA (female)	
Serial port	RS-232	RS-485
Connection method	COMBICON plug-in screw terminal block	COMBICON plug-in screw terminal block
Serial transmission speed	0.3 ... 115.2 kbps	0.3...115.2 kbps
Termination resistor (switchable via DIP switches)	-	390 Ω / 150 Ω / 390 Ω
Analog output	RSSI voltage output	
Signal range	0 V ... 3 V	
Digital output	RF link relay output	
Contact type	PDT	
Switching voltage	30 V AC / 60 V DC	
Switching current	500 mA	
General data		
Supply voltage	19.2 V DC ... 30.5 V DC	
Degree of protection	IP20	
Ambient temperature range	-40 °C ... 70 °C	
Permissible humidity (operation)	20% ... 85%	
Housing material	PA 6.6-FR	
Dimensions W / H / D	35 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance / approvals		
Conformance	FCC Directive, Part 15.247 ISC Directive RSS 210	
ATEX	-	
IECEx	-	
UL, USA / Canada	-	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Wireless module			
	RAD-2400-IFS[1])	**2901541**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-900-IFS	**2901540**	1

Accessories

Conf. stick, configuration memory for network addressing			
RF band 3	**RAD-CONF-RF3**	**2902814**	1
RF band 5	**RAD-CONF-RF5**	**2902815**	1
RF band 7	**RAD-CONF-RF7**	**2902816**	1
Memory stick, for saving custom configuration data	**RAD-MEMORY**	**2902828**	1
USB cable, for diagnostics and extended configuration	**RAD-CABLE-USB**	**2903447**	1

Accessories

RAD-MEMORY	**2902828**	1
RAD-CABLE-USB	**2903447**	1

I/O extension modules

- Easy I/O mapping via thumbwheel
- Digital wide-range inputs (0...250 V AC/DC)
- 0 ... 100 Hz digital pulse inputs
- Relay or transistor outputs
- Easy module replacement even during operation (hot swap)
- Extended temperature range −40°C to +70°C

Notes:

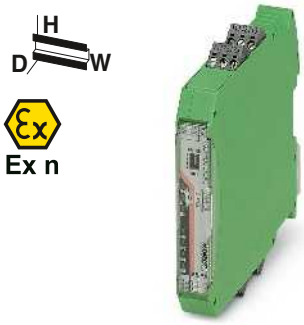
1) EMC: Class A product, see page 553

I/O extension module, 2 digital inputs/outputs and 1 analog input/output

I/O extension module, 4 digital inputs

		Ex: Housing width 17.5 mm	Ex: Housing width 17.5 mm
		Technical data	**Technical data**
Analog input			
Number of inputs		1	-
Resolution		16 (Bit)	-
Signal range (configurable using the DIP switch)		0 mA ... 20 mA / 4 mA ... 20 mA	-
Accuracy		≤ 0.02% (@25°C)	-
Supply voltage	for passive sensors (via terminal PWR1, +I1)	≥ 12 V DC	-
Digital input			
Number of inputs		2	4
Switching level	1 signal ("H")	10 V AC/DC ... 50 V AC/DC (low-voltage input) 50 V AC/DC ... 250 V AC/DC (high-voltage input)	10 V AC/DC ... 50 V AC/DC (low-voltage input) 50 V AC/DC ... 250 V AC/DC (high-voltage input)
Switching level	0 signal ("L")	0 V AC/DC ... 4 V AC/DC (low-voltage input) 0 V AC/DC ... 20 V AC/DC (high-voltage input)	0 V AC/DC ... 4 V AC/DC (low-voltage input) 0 V AC/DC ... 20 V AC/DC (high-voltage input)
Input frequency		≤ 2 Hz	≤ 2 Hz
Pulse input			
Number of inputs		-	-
Signal range		-	-
Input frequency		-	-
Pulse length		-	-
Analog output			
Number of outputs		1	-
Signal range		0 mA ... 20 mA 4 mA ... 20 mA 0 V ... 10 V	-
Accuracy		≤ 0.02% (@25°C) Typ. 0.5%	-
Load R_B		≤ 500 Ω ≥ 10 kΩ	-
Digital output			
Contact type		2 x relay output	-
Switching voltage		250 V AC 24 V DC	-
Switching current	min./max.	≥ 10 mA / 2 A	-
Switching frequency		2 Hz	-
General data			
Supply voltage		19.2 V DC ... 30.5 V DC (T-connector)	19.2 V DC ... 30.5 V DC (T-connector)
Current consumption		max. 95 mA (at 24 V DC, at 25°C)	max. 11 mA (at 24 V DC, at 25°C)
Degree of protection		IP20	IP20
Ambient temperature range		-40 °C ... 70 °C	-40 °C ... 70 °C
Housing material		PA 6.6-FR	PA 6.6-FR
Dimensions W / H / D		17.5 / 99 / 114.5 mm	17.5 / 99 / 114.5 mm
Conformance / approvals			
Conformance		CE-compliant	CE-compliant
ATEX		Ⓔx II 3 G Ex nA nC IIC T4 Gc X	Ⓔx II 3 G Ex nA IIC T4 Gc X
IECEx		Applied for	Applied for
UL, USA / Canada		UL applied for	UL applied for

	Ordering data			**Ordering data**		
Description	**Type**	**Order No.**	Pcs. / Pkt.	**Type**	**Order No.**	Pcs. / Pkt.
Analog/digital I/O module Digital input module Digital relay output module Digital/pulse input module Digital transistor output module	**RAD-DAIO6-IFS[1])**	**2901533**	1	**RAD-DI4-IFS[1])**	**2901535**	1
	Accessories			**Accessories**		
Analog/digital I/O module Digital relay output module Digital input module Digital transistor output module Digital/pulse input module	**RAD-DAIO6-IFS[1])**	**2901533**	1	**RAD-DOR4-IFS[1])**	**2901536**	1

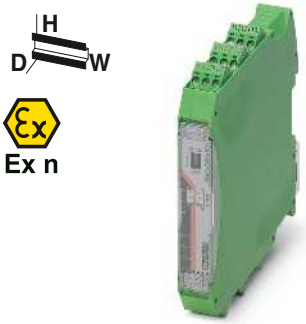


I/O extension module, 4 digital relay outputs

N

I/O extension module, 8 digital inputs and 2 pulse inputs

N



I/O extension module, 8 digital transistor outputs

Ex: Ⓔx

Housing width 17.5 mm

Technical data

-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
4 x relay output	
250 V AC 24 V DC	
≥ 10 mA / 6 A (per channel)	
2 Hz	
19.2 V DC ... 30.5 V DC (T-connector)	
max. 55 mA (at 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
PA 6.6-FR	
17.5 / 99 / 114.5 mm	
CE-compliant	
Ⓔx II 3 G Ex nA nC IIC T4 Gc X	
Applied for	
UL applied for	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-DOR4-IFS[1])	**2901536**	1

Accessories

RAD-DI4-IFS[1])	**2901535**	1

Housing width 17.5 mm

Technical data

-	
-	
-	
-	
-	
-	
2	
10 V DC ... 30.5 V DC	
0 V DC ... 4 V DC	
≤ 10 Hz (static mode)	
2	
0 V DC ... 30.5 V DC	
< 100 Hz (pulse counter mode)	
min. 5 ms	
-	
-	
-	
-	
-	
-	
19.2 V DC ... 30.5 V DC (T-connector)	
max. 18 mA (at 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
PA 6.6-FR	
17.5 / 99 / 114.5 mm	
CE-compliant	
Ⓔx II 3 G Ex nA IIC T4 Gc X	
Applied for	
UL applied for	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-DI8-IFS	**2901539**	1

Accessories

RAD-DO8-IFS	**2902811**	1

Housing width 17.5 mm

Technical data

-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
8 x transistor output, active	
30.5 V DC	
- / 250 mA (per channel)	
10 Hz	
19.2 V DC ... 30.5 V DC (T-connector)	
max. 22 mA (at 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
PA 6.6-FR	
17.5 / 99 / 114.5 mm	
CE-compliant	
Ⓔx II 3 G Ex nA IIC T4 Gc X	
Applied for	
UL applied for	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-DO8-IFS	**2902811**	1

Accessories

RAD-DI8-IFS	**2901539**	1

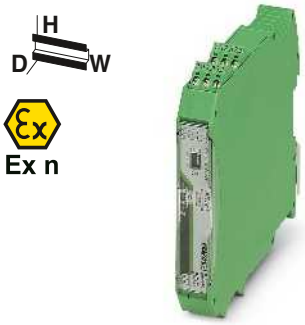
I/O extension modules

N

- Easy I/O mapping via thumbwheel
- Analog inputs (0/4 ... 20 mA)
- Temperature inputs for Pt 100 sensors
- Analog outputs (0/4 ... 20 mA or 0 ... 10 V)
- Easy module replacement even during operation (hot swap)
- Extended temperature range −40°C to +70°C

Notes:

1) EMC: Class A product, see page 553



I/O extension module, 4 analog current inputs

Temperature I/O extension module, 4 temperature inputs

	Ex: Housing width 17.5 mm	Housing width 17.5 mm
	Technical data	**Technical data**
Analog input		
Number of inputs	4	-
Resolution	16 (Bit)	-
Signal range (configurable using the DIP switch)	0 mA ... 20 mA / 4 mA ... 20 mA	-
Accuracy	≤ 0.02% (@25°C)	-
Supply voltage for passive sensors (via terminal PWR1, +I1)	≥ 12 V DC	-
Analog input		
Description of the input	-	Pt 100 input
Number of inputs	-	4
Temperature measuring range	-	-50 °C ... 250 °C
Analog output		
Number of outputs	-	-
Signal range	-	-
Accuracy	-	-
Load R_B	-	-
General data		
Supply voltage	19.2 V DC ... 30.5 V DC (T-connector)	19.2 V DC ... 30.5 V DC (T-connector)
Current consumption	max. 120 mA (at 24 V DC, at 25°C)	max. 45 mA (at 24 V DC, at 25°C)
Degree of protection	IP20	IP20
Ambient temperature range	-40 °C ... 70 °C	-40 °C ... 70 °C
Housing material	PA 6.6-FR	PA 6.6-FR
Dimensions W / H / D	17.5 / 99 / 114.5 mm	17.5 / 99 / 114.5 mm
Conformance / approvals		
Conformance	CE-compliant	CE-compliant
ATEX	Ⓔx II 3 G Ex nA IIC T4 Gc X	Ⓔx II 3 G Ex nA IIC T4 Gc X
IECEx	Applied for	Applied for
UL, USA / Canada	UL applied for	UL applied for

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Analog input module Temperature input module Analog output module	**RAD-AI4-IFS[1])**	**2901537**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-PT100-4-IFS	**2904035**	1

Accessories

Analog output module Analog input module Temperature input module	**RAD-AO4-IFS[1])**	**2901538**	1

Accessories

Type	Order No.	Pcs. / Pkt.
RAD-AO4-IFS[1])	**2901538**	1

**I/O extension module,
4 analog current/voltage outputs**

Ex:
Housing width 17.5 mm

Technical data

-	
-	
-	
-	
-	
-	
-	
-	
-	
4	
0 mA ... 20 mA	0 V ... 10 V
4 mA ... 20 mA	
≤ 0.02% (@25°C)	Typ. 0.5%
≤ 500 Ω	≥ 10 kΩ
19.2 V DC ... 30.5 V DC (T-connector)	
max. 115 mA (at 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
PA 6.6-FR	
17.5 / 99 / 114.5 mm	
CE-compliant	
II 3 G Ex nA IIC T4 Gc X	
Applied for	
UL applied for	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-AO4-IFS[1])	**2901538**	1

Accessories

RAD-AI4-IFS[1])	**2901537**	1
RAD-PT100-4-IFS	**2904035**	1

Wireless I/O

Wireless MUX - the wireless signal cable

The Wireless MUX transmits 16 digital and 2 analog signals bidirectionally. The Wireless MUX is supplied ready to use: unpack – connect – switch on – and you have a working wireless path.

– Range*:
With omnidirectional antenna, 50 m to 100 m in halls, up to 200 m outdoors.
With PANEL antennas, up to 400 m outdoors.

Fieldline I/O for wireless fieldbus extension

The Bluetooth I/O system integrates I/O signals into a fieldbus or an Ethernet network via Bluetooth.

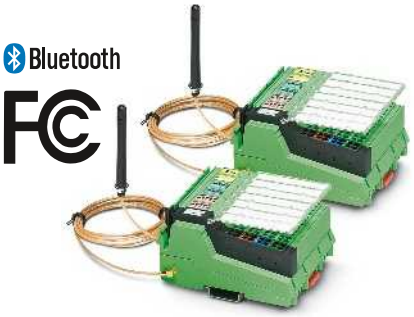
Advantages of Bluetooth technology:

– Extremely rugged and reliable
– Simple and fast commissioning
– WLAN coexistence functions AFH, LEM, black channel listing
– Parallel operation of several Bluetooth systems
– Range*:
20 m to 50 m in industrial halls, up to over 100 m outdoors.

Notes:

* The range may be significantly above or below that stated, and depends on the environment, antenna technology, and the product used.

1) EMC: Class A product, see page 553



Wireless set, including antennae

Technical data

Wireless interface	
Wireless standard	Bluetooth 1.2
Frequency range	2.402 GHz ... 2.48 GHz (ISM bandwidth)
Transmission power	16 dBm (40 mW, controlled automatically)
Wireless modules that can be connected	-
Antenna connection method	MCX (female)
Fieldbus interface	
Name	-
Transmission speed	-
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including ripple)
Digital inputs	
Connection technology	1-wire
Number of inputs	16
Digital outputs	
Connection technology	1-wire
Number of outputs	16
Analog inputs	
Number of inputs	2
Voltage input signal	0 V ... 10 V
Current input signal	0 mA ... 20 mA
Measured value resolution	12 bits
Analog outputs	
Number of outputs	2
Voltage output signal	0 V ... 10 V
Current output signal	0 mA ... 20 mA
DAC resolution	12 bit
General data	
Width	95 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Wireless MUX set, consisting of two modules including antennas, each with 16 digital and 2 analog inputs and outputs			
- With OMNI antennas, 16 dBm transmission power	**ILB BT ADIO MUX-OMNI**	**2884208**	1
- With OMNI antennas, 8 dBm transmission power, maritime approvals	**ILB BT ADIO MUX-OMNI 8/M[1])**	**2693185**	1
- With PANEL antennas, 12 dBm transmission power, 8 dBi antenna gain	**ILB BT ADIO MUX-PANEL**	**2884509**	1
Fieldline Modular Wireless IO base station for up to three wireless IO devices - Adjustable transmission power			
Fieldline Modular wireless I/O device - Adjustable transmission power - 16 inputs			
Inline Block wireless I/O device - Adjustable transmission power			

Fieldline local bus base station, Incl. OMNI antenna

I/O wireless module, incl. OMNI antenna

I/O wireless module, incl. OMNI antenna

Technical data

Bluetooth 1.2	
2.402 GHz ... 2.48 GHz (ISM bandwidth)	
8 dBm (6.3 mW, controlled automatically)	
Up to 3	
SMA (female)	
Fieldline Modular local bus	
500 kbaud / 2 Mbaud (data rate can be changed via pin 5 (voltage supply ULS)	
24 V DC	
19.2 V DC ... 30 V DC (including ripple)	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
70.5 mm	
IP65	
-25 °C ... 60 °C	

Technical data

	FLM BT DIO 8/8 M12[1])	FLM BT DI 16 M12[1])
Bluetooth 1.2		
2.402 GHz ... 2.48 GHz (ISM bandwidth)		
8 dBm (6.3 mW, controlled automatically)		
1 (FLM BT BS 3, FL BT MOD IO AP)		
SMA (female)		
-		
-		
24 V DC		
19.2 V DC ... 30 V DC (including ripple)		19.2 V DC ... 32 V DC
	2, 3-wire	2 or 3-wire (optionally 4-wire)
	8	16
	2, 3-wire	-
	8	-
	-	
	-	
	-	
	-	
	-	
	-	
	-	
	-	
70.5 mm		
IP65		
-25 °C ... 60 °C		

Technical data

Bluetooth 1.2
2.402 GHz ... 2.48 GHz (ISM bandwidth)
16 dBm (can be set between 0 dBm/1 mW and 16 dBm/39.8 mW in 4 dB increments)
1 (FLM BT BS 3, FL BT MOD IO AP)
SMA (female)
-
-
24 V DC
19.2 V DC ... 30 V DC (including ripple)
1-wire
16
1-wire
16
2
0 V ... 10 V
0 mA ... 20 mA
12 bits
2
0 V ... 10 V
0 mA ... 20 mA
12 bit
117 mm
IP20
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM BT BS 3[1])	**2736770**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM BT DIO 8/8 M12[1])	**2736767**	1
FLM BT DI 16 M12[1])	**2693208**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
ILB BT ADIO 2/2/16/16[1])	**2884282**	1

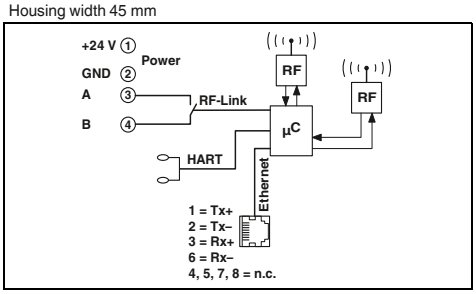
WirelessHART gateway

The **RAD-WHG/WLAN-XD** is a WirelessHART gateway with integrated 802.11b/g WLAN transceiver. It converts HART data to Modbus TCP for easy integration into almost any host system.

– Simple programming and diagnostics using an embedded web server or HART programmer
– WirelessHART gateway supports 250 WirelessHART devices
– 802.11b/g client can be used as WirelessHART backhaul connection with 802.11i (WPA2) 128-bit AES encryption
– Fully meshed routing (self-organizing and self-healing network) with WirelessHART
– WirelessHART uses "channel hopping" as a means of tolerating interference

WirelessHART gateway

Ex:
Housing width 45 mm

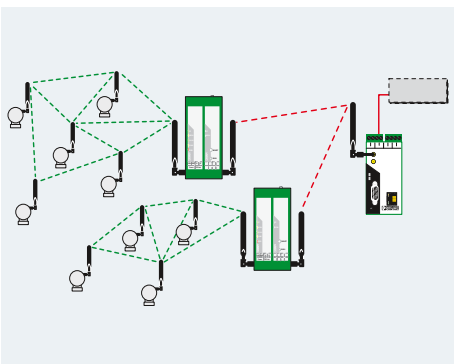


Technical data

Wireless path		
Interface description		WLAN as per IEEE 802.11 b/g
Direction		Bi-directional
Frequency range		2.4 GHz ... 2.472 GHz
Transmission power		0 ... 20 dBm
Number of channels		13
Connection method		Socket
Wireless path		
Interface description		WirelessHART
Frequency range		2.4 GHz ... 2.4835 GHz
Transmission power		0 ... 10 dBm
Number of channels		15
Connection method		Socket
Ethernet interface		
Connection method		RJ45
Transmission speed		10/100 Mbps
General data		
Supply voltage		9 V DC ... 30 V DC
Current consumption	typ. / max.	125 mA (at 24 V DC) / 300 mA (at 24 V DC)
Degree of protection		IP20
Ambient temperature range		-40 °C ... 70 °C
Housing material		Polyamide PA non-reinforced
Dimensions W / H / D		45 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14
Conformance / approvals		
Conformance		CE-compliant FCC Directive, Part 15.247
CSA, USA		Class I, Zone 2, Group IIC ; AEx nA IIC T4
CSA, Canada		Class I, Division 2 Groups A,B,C,D Ex nA IIC T4

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
WirelessHART gateway	**RAD-WHG/WLAN-XD**	**2900178**	1



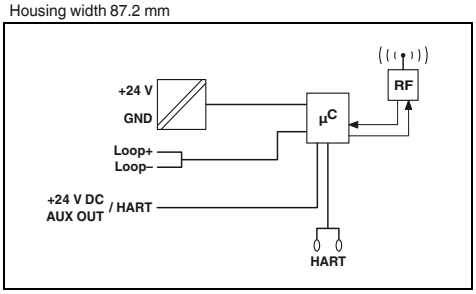
WirelessHART adapter

The **RAD-WHA-1/2NPT** is an adapter that allows up to 4 HART devices to be on a WirelessHART network.

– Allows wired HART devices to transfer data on a WirelessHART network
– Connect up to 4 HART device to one adapter
– Allows connection of one standard 4... 20 mA signal for easy integration of non-HART devices into a WirelessHART network
– 1/2-in. NPT fitting allows remote mounting or direct connection to instrument
– Removable antenna for connection of coaxial cable and high gain antenna

WirelessHART adapter

Housing width 87.2 mm



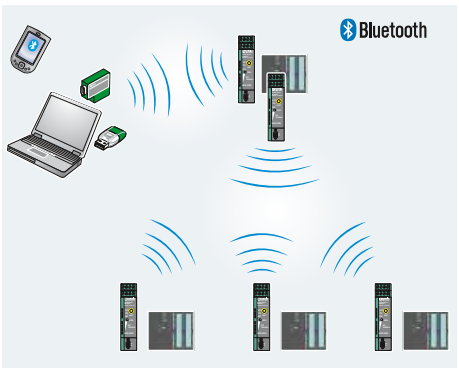
Technical data

Wireless path		
Interface description		WirelessHART
Direction		Bi-directional
Frequency range		2.4 GHz ... 2.4835 GHz
Transmission power		0 ... 10 dBm
Number of channels		15
Connection method		N (female)
Analog input		
Number of inputs		1
Signal range		4 mA ... 20 mA
General data		
Supply voltage		11 V DC ... 30 V DC
Current consumption	max.	95 mA
Degree of protection		IP67
Ambient temperature range		-40 °C ... 70 °C
Housing material		Aluminum, die-cast, corrosion resistant, powder-coated
Dimensions W / H / D		87.2 / 161 / 65.3 mm
Connection method		Flying leads, 20 AWG
Conformance / approvals		
Conformance		-

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
WirelessHART adapter	**RAD-WHA-1/2NPT**	**2900100**	1

Bluetooth interface converter for V.24 (RS-232), RS-422, RS-485 2-wire



Bluetooth converter, universal for V.24 (RS-232), RS-422, RS-485 2-wire

Applications:

The Bluetooth converter is used to convert V.24 (RS-232), RS-422, and RS-485 2-wire or USB interfaces to the licence-free Bluetooth wireless standard. It serves as a straightforward and flexible substitute for a cable in order, for example, to perform programming/diagnostics tasks via a notebook or as a cost-effective alternative to slip rings, drag chains or fieldbus cables, such as Modbus, PROFIBUS, etc.

Topology:

– Point-to-point
– Multipoint with up to seven slaves

Features:

Flexible parameterization/application options:

– Can be used for V.24 (RS-232)/RS-422/RS-485-2 2-wire interfaces up to 187.5 kbps
– Transceiver for distances of up to 150 m

High transmission reliability:

– Secure and tamper-proof data transmission thanks to password protection, encryption, plus fixed and invisible device pairing
– Coexistence with other wireless systems thanks to adaptive frequency hopping (AFH) method

Easy installation:

– Wireless path diagnostics based on integrated bar graphs and 2 digital outputs
– Installation of parallel wireless paths thanks to 24 V DC and RS-485 cross-wiring
– Local configuration via USB interface without separate power supply unit

Technical data

Supply	
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage	19 V AC ... 29 V AC
Supply voltage	24 V DC ±20% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption	≤ 100 mA (24 V DC)
Serial port	
Connection method	D-SUB-9 plug Plug-in screw connection
Transmission speed	0.3 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 31.25 ; 38.4 ; 57.6 ; 75 ; 93.75 ; 115.2 kbps 0.3 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 31.25 ; 38.4 ; 57.6 ; 75 ; 93.75 ; 115.2 ; 136 ; 187.5 kbps
Wireless interface	
Antenna connection	External
Transmission power	-28 dBm to 14 dBm (can be set via software)
Receiver sensitivity	-91.00 dBm
Frequencies	2.402 GHz ... 2.48 GHz (ISM bandwidth)
Range depending on spatial conditions	≤ 150 m (14 dBm)
Bluetooth Multidrop master / slave	1/7
General data	
Ambient temperature (operation)	-20 °C ... 60 °C
Electromagnetic compatibility	Conformance with R&TTE directive 1999/5/EC
Dimensions W / H / D	22.5 mm / 99 mm / 116 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PSI Bluetooth converter, MCX connection for external antenna			
- Device with 2x diagnostic outputs	**PSI-WL-RS232-RS485/BT/2DO**	**2313805**	1
- Device with HazLoc approval	**PSI-WL-RS232-RS485/BT/HL**	**2313795**	1
PSI Bluetooth PROFIBUS-SET, supplied as standard: 2x PSI Bluetooth converters, 2x OMNI omnidirectional antennas			
PSI Bluetooth USB adapter, internal antenna			

Accessories

RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1
Omnidirectional antenna	**RAD-ISM-2400-ANT-OMNI-2-1**	**2867461**	1
PANEL directional wireless antenna (without cable)	**RAD-ISM-2400-ANT-PAN- 8-0**	**2867610**	1
Antenna adapter cable	**RAD-PIG-EF316-MCX-SMA**	**2867678**	1
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50

Bluetooth set
Pre-configured for PROFIBUS connections

Bluetooth USB adapter

Technical data	
10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	-
19 V AC ... 29 V AC (via plug-in COMBICON screw terminal block)	-
24 V DC ±20% (as an alternative or redundant, via backplane bus contact and system current supply)	5 V DC (directly via the USB interface)
≤ 100 mA (24 V DC)	100 mA (5 V DC)
COMBICON screw terminal block	USB type A, plug
Preconfigured	Up to 2.1 Mbps
External 14 dBm	Internal 20 dBm
-91.00 dBm 2.402 GHz ... 2.48 GHz (ISM bandwidth) ≤ 150 m (14 dBm) -	-80.00 dBm 2.402 GHz ... 2.48 GHz (ISM bandwidth) 20 dBm (100 mW) = 80 m ... 150 m -
-20 °C ... 60 °C Conformance with R&TTE directive 1999/5/EC 22.5 mm / 99 mm / 116 mm	0 °C ... 70 °C Conformance with R&TTE directive 1999/5/EC 18 mm / 58 mm / 8 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-WL-PROFIB/BT-SET/2DO	**2313876**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-WL-PLUG-USB/BT	**2313083**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50

Accessories

Accessories
Omnidirectional antennas

– For mobile or point-to-multipoint applications with a small range
– Version with higher impact strength that is not immediately recognizable as an antenna

2 dBi gain

3 dBi gain, higher impact strength

		Technical data	Technical data
General data			
Ambient temperature range		-20 °C ... 65 °C	-40 °C ... 80 °C
Degree of protection		IP65	IP55
Impact strength		-	IK08
Gain		2 dBi	3 dBi
Impedance		50 Ω	50 Ω
Acceptance angle	vertical / horizontal	75 ° / 360 °	85 ° / 360 °
Dimensions W / H		7.8 / 82.5 mm	86 / 43 mm
Frequency range		2.4 GHz	2.4 GHz
Scope of supply		Incl. mounting material	-

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
With connection MCX (male)	**RAD-ISM-2400-ANT-OMNI-2-1**	**2867461**	1	**RAD-ISM-2400-ANT-VAN- 3-1-MCX**	**2885702**	1
With connection RSMA (male)	**RAD-ISM-2400-ANT-OMNI-2-1-RSMA**	**2701362**	1	**RAD-ISM-2400-ANT-VAN-3-0-RSMA**	**2701358**	1
With SMA connection (male)				**RAD-ISM-2400-ANT-VAN- 3-0-SMA**	**2885867**	1
Mounting material for wall mounting				**RAD-ANT-VAN-MKT**	**2885870**	1

Omnidirectional Antennas

– For mobile applications with a longer range

6 dBi gain

Gain up to 6 dBi/8 dBi, Dual band

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 75 °C	-40 °C ... 80 °C
Degree of protection		IP55	IP68
Gain		6 dBi	6 dBi (2.4 GHz, when mounted on metal surface)
Impedance		50 Ω	50 Ω
Acceptance angle	vertical / horizontal	30 ° / 360 °	- / 360 °
Dimensions W / H		22 mm / 250 mm	92 mm / 51 mm
Frequency range		2.4 GHz	2.4 GHz
Scope of supply		Incl. mounting material	-

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
With connection N (female)	**RAD-ISM-2400-ANT-OMNI-6-0**	**2885919**	1			
With connection N (female), salt water resistant	**RAD-2400-ANT-OMNI-6-0-SW**	**2903219**	1			
Dual band omnidirectional antenna with vandalism protection						
With adapter cable N (male) -> SMA (male)				**RAD-ISM-2459-ANT-FOOD-6-0**	**2692526**	1
With adapter cable N (male) -> MCX (male)				**RAD-ISM-2459-ANT-FOOD-6-0-MCX**	**2700674**	1

Accessories
Directional wireless antennas

– For large distances with line of sight

8 dBi gain

19 dBi gain

	Technical data		Technical data
General data	ANT-DIR-2459-01	RAD-...PAN-8-0	
Ambient temperature range	-40 °C ... 80 °C	-40 °C ... 75 °C	-40 °C ... 70 °C
Degree of protection	IP67	IP55	IP65
Gain	9 dBi	8 dBi	19 dBi
Impedance	50 Ω	50 Ω	50 Ω
Acceptance angle vertical / horizontal	55 ° (at 2.4 GHz) / 75 ° (at 2.4 GHz)	70 ° / 75 °	11 ° / 17 °
Dimensions W / H	80 / 101 mm	80 / 100 mm	610 / 419 mm
Frequency range	2.4 GHz	2.3 GHz	2.4 GHz
Scope of supply	Incl. mounting material	Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
PANEL directional wireless antenna (without cable)						
With connection N (female)	**ANT-DIR-2459-01**	**2701186**	1			
With connection SMA (female)	**RAD-ISM-2400-ANT-PAN- 8-0**	**2867610**	1			
Parabolic antenna						
With connection N (female)				**RAD-ISM-2400-ANT-PAR-19-0**	**2867885**	1

Weather protection

Sealing tape

– Provides additional weather protection for adapters, splitters, cable connections, etc.
– Self-vulcanizing

	Technical data
General data	
Ambient temperature range	-40 °C ... 90 °C
Properties	Self-vulcanizing
Width	19 mm
Length	3 m
Thickness	0.75 mm

	Ordering data		
Description	Type	Order No.	Pcs. / Pkt.
Weather protection tape			
	RAD-TAPE-SV-19-3	**2903182**	1

Accessories

Antenna splitter
– For connecting two panel antennas for repeater applications

Surge protection
– For installing the antenna outside buildings from a cable length of 3 m

Antenna splitter, 2-way

Protection adapter for coaxial connections

	Technical data	Technical data
General data		
Ambient temperature range	-40 °C ... 85 °C	-40 °C ... 90 °C
Degree of protection	IP20	IP68
Attenuation per branch (at 2400 MHz)	3 dB	Typ. 0.05 dB (≤ 0.15 dB)
Connection method	2x SMA (female), 1x SMA (male)	-
Frequency range	2.3 GHz ... 2.5 GHz	2.4 GHz ... 5.9 GHz
Scope of supply	2-way splitter, adapter from N (female) to SMA (female), 4 strips of self-vulcanizing weather protection tape	-

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Antenna splitter						
Double	**RAD-ISM-2400-SPL-2-SMA**	**2885595**	1			
COAXTRAB, protection adapter for antenna connections with Lambda/4 technology, 2.4 to 5.9 GHz						
N (female) -> N (female)				**CN-LAMBDA/4-5.9-BB**	**2838490**	1
N(male) -> N(female)				**CN-LAMBDA/4-5.9-SB**	**2800023**	1

Accessories

Adapter cable
– For adaptation of wireless module for antenna
– Attenuation:
Approximately 0.55 dB/m at 900 MHz
Approximately 0.80 dB/m at 2.4 GHz
Approximately 1.10 dB/m at 5 GHz

Adapter
– For installing the antenna inside buildings

Antenna adapter cable, N (male) -> RSMA (male)

Adapter

	Technical data	Technical data
General data		
Ambient temperature range	-40 °C ... 85 °C	-65 °C ... 165 °C
Degree of protection	-	IP20
Impedance	50 Ω	50 Ω

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable						
0.5 m long	**RAD-PIG-RSMA/N-0.5**	**2903263**	1			
1 m long	**RAD-PIG-RSMA/N-1**	**2903264**	1			
2 m long	**RAD-PIG-RSMA/N-2**	**2903265**	1			
3 m long	**RAD-PIG-RSMA/N-3**	**2903266**	1			
Adapter						
N (female) -> N (female)				**RAD-ADP-N/F-N/F**	**2867843**	1
N (male) -> SMA (female)				**RAD-ADP-N/M-SMA/F**	**2917036**	1
RSMA (female) -> SMA (female)				**RAD-ADP-RSMA/F-SMA/F**	**2884538**	1
SMA (female) -> SMA (female)				**RAD-ADP-SMA/F-SMA/F**	**2884541**	1
SMA (female) -> SMA (female), perpendicular				**RAD-ADP-SMA/F-SMA/M-90**	**2917324**	1

Accessories
Adapter/extension cables

– Extension or adaptation of wireless module for antenna

Notes:

Keep the connection from the wireless module to the antenna as short as possible, as every cable leads to attenuation.

Antenna adapter cable

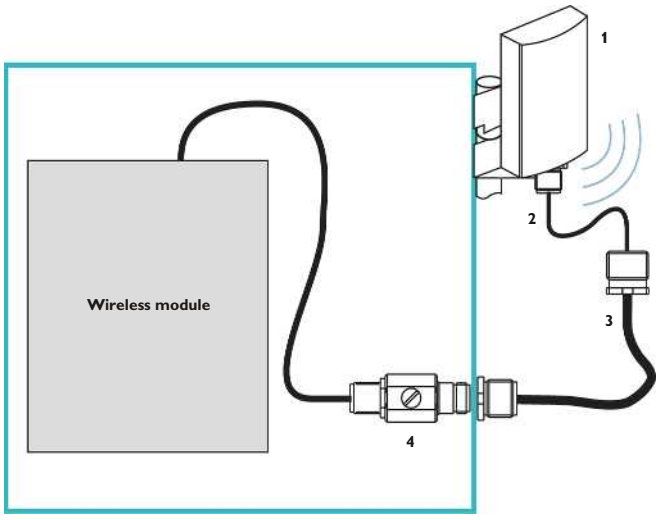
Antenna cable for longer connections

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 70 °C	-40 °C ... 105 °C
Attenuation / impedance	(at 2400 MHz)	approx. 1.5 dB/m / 50 Ω	approx. 0.27 dB/m for 900 MHz / 50 Ω

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable						
1 m long, MCX (male) -> SMA (male)	**RAD-PIG-EF316-MCX-SMA**	**2867678**	1			
50 cm long, MCX (male) -> N (male)	**RAD-PIG-EF316-MCX-N**	**2867681**	1			
30 cm long, N (female) -> SMA (male)	**RAD-PIG-EF316-N-SMA**	**2867694**	1			
50 m long, N (female) -> N (male)	**RAD-PIG-EF316-N-N**	**2867704**	1			
50 cm long, SMA (male) -> SMA (male)	**RAD-PIG-EF316-SMA-SMA**	**2885618**	1			
Antenna extension cable						
3 m long, N connection at both ends (male)				**RAD-CAB-EF393- 3M**	**2867649**	1
5 m long, N connection at both ends (male)				**RAD-CAB-EF393- 5M**	**2867652**	1
10 m long, N connection at both ends (male)				**RAD-CAB-EF393-10M**	**2867665**	1
15 m long, N connection at both ends (male)				**RAD-CAB-EF393-15M**	**2885634**	1
3 m long, SMA connection at both ends (male)				**RAD-CAB-EF142-3M**	**2884512**	1
5 m long, SMA connection at both ends (male)				**RAD-CAB-EF142-5M**	**2884525**	1

Control cabinet/switch box

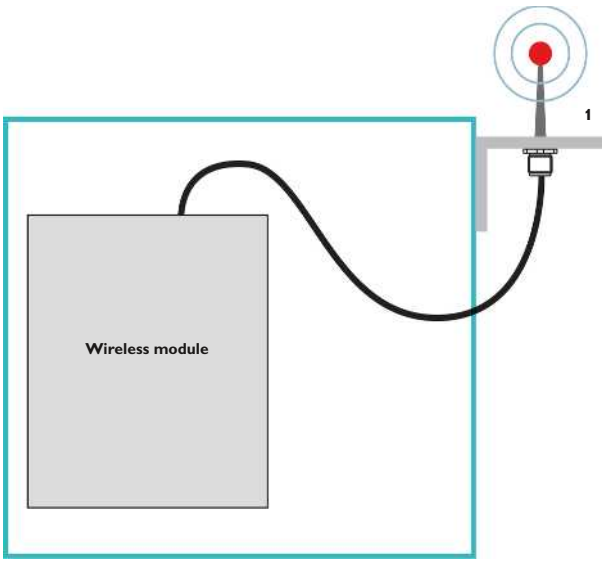
– For antennas with extension cable, with surge protection



1 Antenna
2 Antenna adapter cable (pigtail)
3 Antenna extension cable
4 Surge protection

Control cabinet/switch box

– For antennas without extension cable, without surge protection



RAD-Line IO - UD wireless system with Trusted Wireless

The **RAD-ISM-900-SET...UD...** uni-directional wireless radio system consists of

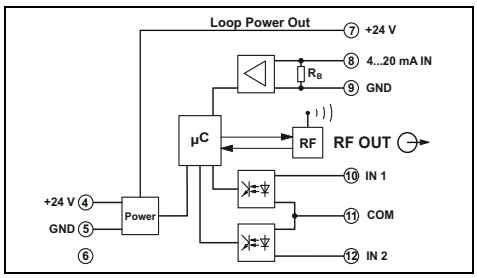
– Two transceivers preconfigured to communicate to one another
– Two omnidirectional antennas
– Operates in the license-free 902-928 MHz ISM band
– Frequency-hopping spread spectrum technology
– Transmitter can be DIN rail mounted ME housing or IP65 conduit style
– Conduit-style transmitters can be either 24 V DC or 120/240 V AC powered
– Receiver is DIN rail mounted ME housing, 24 V DC powered

– Integrated I/O allows connection directly to analog and digital inputs/outputs

Notes:

The products are offered exclusively for export outside the European Economic Area (EEA).

Set consisting of transmitter, receiver and two antennas with connecting cables



Technical data

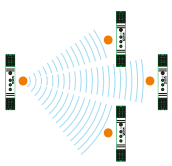
Wireless path		America	Australia	New Zealand
Direction		Uni-directional	Uni-directional	Uni-directional
Frequency range		902 ... 928	915.1 ... 927.8	921.4 ... 927.7 [MHz]
Transmission power		1 W	1 W	1 W
Number of channels		4 x 63	2 x 63	1 x 63
Analog input				
Number of inputs / signal range		1 x 4 mA ... 20 mA		
Input resistance		< 150 Ω		
Digital input				
Number of inputs / signal range		2 x 5 V AC/DC ... 30 V AC/DC		
Switching level	1 signal ("H")	min. 5 V DC		
	0 signal ("L")	max. 1.5 V DC		
Analog output				
Number of outputs / Signal range		1 x 4 mA ... 20 mA		
Load R_B		700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)		
Digital output		3 floating PDT contacts		
Switching voltage		30 V DC / 120 V AC		
Switching current		0.5 A		
General data		Transmitter (TX)		Receiver (RX)
Supply voltage		12 V DC ... 30 V DC		12 V DC ... 30 V DC
Current consumption	Typ./max.	75 mA / 350 mA		85 mA / 125 mA
Degree of protection		-		-
Ambient temperature range		-40 °C ... 70 °C		-40 °C ... 70 °C
Housing material		Polyamide PA non-reinforced		Polyamide PA non-reinforced
Dimensions W / H / D		17.5 / 99 / 114.5 mm		17.5 / 99 / 114.5 mm
Conformance / approvals				
Conformance		FCC Directive, Part 15.247 ISC Directive RSS 210		
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D		

Ordering data

Description		Type	Order No.	Pcs. / Pkt.
Wireless set (transmitter, receiver, including antennas)				
	America	**RAD-ISM-900-SET-UD-ANT**	**2867102**	1
Receiver (individual)		**RAD-ISM-900-RX**	**2867047**	1
Wireless set (transmitter, receiver, including antennas)				
	Australia	**RAD-ISM-900-SET-UD-ANT-AU**	**2867416**	1
Receiver (individual)		**RAD-ISM-900-RX-AU**	**2867445**	1
Wireless set (transmitter, receiver, including antennas)				
	New Zealand	**RAD-ISM-900-SET-UD-ANT-NZ**	**2885029**	1
Receiver (individual)		**RAD-ISM-900-RX-NZ**	**2885058**	1

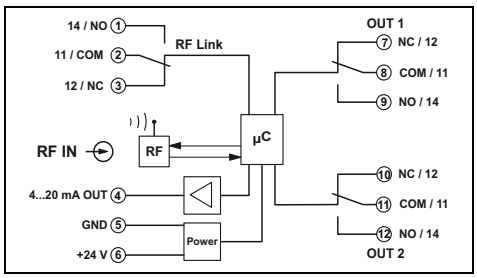
Point-to-point

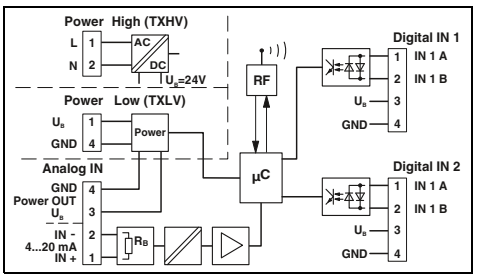
Point-to-multipoint



Set, consisting of transmitter for the mains connection (IP65) and receiver (IP20) including antennas

Set, consisting of transmitter for the low-voltage range (IP65) and receiver (IP20) including antennas





Technical data

America	Australia	New Zealand	
Uni-directional	Uni-directional	Uni-directional	
902 ... 928	915.1 ... 927.8	921.4 ... 927.7	[MHz]
1 W	1 W	1 W	
4 x 63	2 x 63	1 x 63	
1 x 4 mA ... 20 mA			
< 170 Ω			
2 x 85 V AC ... 240 V AC			
-			
-			
1 x 4 mA ... 20 mA			
700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)			
3 floating PDT contacts			
30 V DC / 120 V AC			
0.5 A			
Transmitter (TX)		Receiver (RX)	
100 V AC ... 240 V AC		12 V DC ... 30 V DC	
57 mA / 109 mA		85 mA / 125 mA	
-		-	
-40 °C ... 70 °C		-40 °C ... 70 °C	
5052H32AL PBT		Polyamide PA non-reinforced	
57 / 57 / 280 mm		17.5 / 99 / 114.5 mm	
FCC Directive, Part 15.247			
ISC Directive RSS 210			
Class I, Div. 2, Groups A, B, C, D			

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ISM-900-SET-AC-UD	**2867021**	1
RAD-ISM-900-SET-AC-UD-AU	**2867429**	1
RAD-ISM-900-SET-AC-UD-NZ	**2885032**	1

Technical data

America	Australia	New Zealand	
Uni-directional	Uni-directional	Uni-directional	
902 ... 928	915.1 ... 927.8	921.4 ... 927.7	[MHz]
1 W	1 W	1 W	
4 x 63	2 x 63	1 x 63	
1 x 4 mA ... 20 mA			
< 170 Ω			
2 x 5 V AC/DC ... 30 V AC/DC			
min. 5 V DC			
max. 1.5 V DC			
1 x 4 mA ... 20 mA			
700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)			
3 floating PDT contacts			
30 V DC / 120 V AC			
0.5 A			
Transmitter (TX)		Receiver (RX)	
9 V DC ... 30 V DC		12 V DC ... 30 V DC	
75 mA / 350 mA		85 mA / 125 mA	
-		-	
-40 °C ... 70 °C		-40 °C ... 70 °C	
5052H32AL PBT		Polyamide PA non-reinforced	
57 / 57 / 280 mm		17.5 / 99 / 114.5 mm	
FCC Directive, Part 15.247			
ISC Directive RSS 210			
Class I, Div. 2, Groups A, B, C, D			

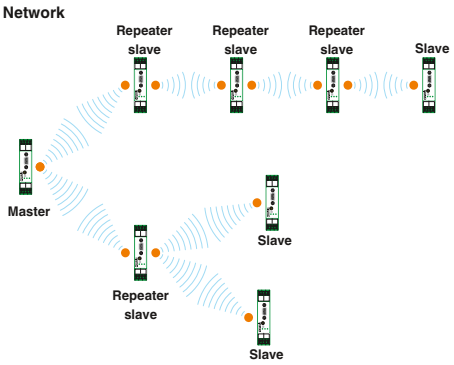
Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ISM-900-SET-DC-UD	**2867034**	1
RAD-ISM-900-SET-DC-UD-AU	**2867432**	1
RAD-ISM-900-SET-DC-UD-NZ	**2885045**	1

RAD-Line Serial IO - BD wireless system for transmission of serial data and I/O signals

The **RAD-ISM-900-DATA-BD-BUS...** bi-directional wireless radio allows wireless connection of several decentralized controllers and the reception and output of I/O signals from the field to a central location (controller).

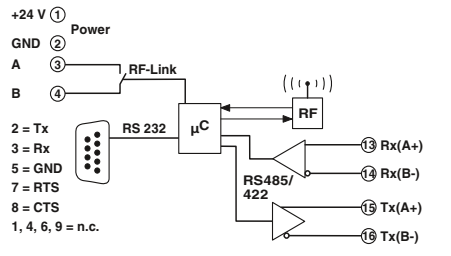
- Operates in the license-free 902-928 MHz ISM band
- Frequency-hopping spread spectrum technology
- Provides an interface for transfer of I/O data between 900 MHz wireless and RS-232, RS-422, and RS-485 interfaces
- Programmable for point-to-point, point-to-multipoint and multipoint-to-point configurations
- Integrated bus foot allows connection to additional I/O modules
- Individual modules can be configured as master, slave or repeater
- Up to 254 slaves may operate from a single master



Wireless transceiver for serial interfaces (RS-232, RS-422/RS-485)

Ex: cULus

Housing width 22.5 mm



Notes:

The basic software for the configuration and diagnostics of two network devices can be downloaded free of charge at www.phoenixcontact.com. A software license is required to perform the diagnostic functions for multiple network devices.

The products are offered exclusively for export outside the European Economic Area (EEA).

Technical data

Wireless path	America	Australia	New Zealand	
Direction	Bi-directional	Bi-directional	Bi-directional	
Frequency range	902 ... 928	915.1 ... 927.8	921.4 ... 927.7	[MHz]
Transmission power	1 W	1 W	1 W	
Number of channels	4 x 63	2 x 63	1 x 63	
Serial port	RS-232		RS-485/RS-422	
Connection method	9-pos. D-SUB (socket)		COMBICON plug-in screw terminal block	
Serial transmission speed	1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps		1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps	
Data format/coding	Asynchronous			
Data flow control/protocols	RTS/CTS			
Analog input				
Number of inputs	-			
Signal range	-			
Input resistance	-			
Digital input				
Number of inputs	-			
Switching level	1 signal ("H")	-		
	0 signal ("L")	-		
Pulse input				
Switching level	1 signal ("H")	-		
	0 signal ("L")	-		
Pulse time	-			
Digital output				
Switching voltage	-			
Switching current	-			
General data				
Supply voltage	9 V DC ... 30 V DC			
Current consumption typ. / max.	110 mA / 180 mA			
Degree of protection	IP20			
Ambient temperature range	-40 °C ... 70 °C			
Housing material	Polyamide PA non-reinforced			
Dimensions W / H / D	22.5 / 99 / 114.5 mm			
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12			
Conformance / approvals				
Conformance	FCC Directive, Part 15.247 ISC Directive RSS 210			
UL, USA / Canada	Class I, Div. 2, Groups A, B, C, D			

Ordering data

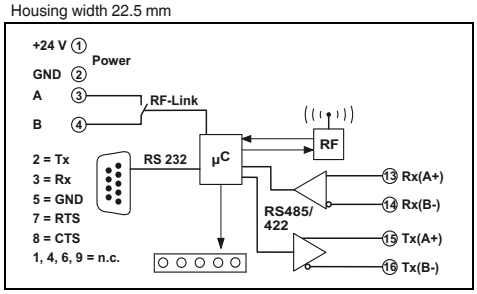
Description		Type	Order No.	Pcs. / Pkt.
Wireless module with serial interface	America	**RAD-ISM-900-DATA-BD**	**2867131**	1
Wireless module with serial interface	Australia	**RAD-ISM-900-DATA-BD-AU**	**2867953**	1
Wireless module with serial interface	New Zealand	**RAD-ISM-900-DATA-BD-NZ**	**2885155**	1

Wireless transceiver for serial interfaces (RS-232, RS-422/RS-485), can be extended

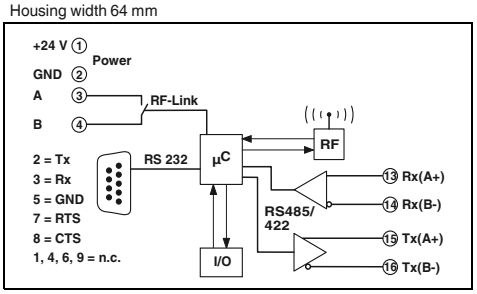
Wireless transceiver for serial interfaces (RS-232, RS-422/RS-485), with integrated inputs/outputs

Ex: c UL us

Housing width 22.5 mm



Housing width 64 mm



Technical data

America	Australia	New Zealand
Bi-directional	Bi-directional	Bi-directional
902 ... 928	915.1 ... 927.8	921.4 ... 927.7 [MHz]
1 W	1 W	1 W
4 x 63	2 x 63	1 x 63
RS-232		RS-485/RS-422
9-pos. D-SUB (socket)		COMBICON plug-in screw terminal block
1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps		1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps
Asynchronous		
RTS/CTS		
-		
-		
-		
-		
-		
-		
-		
-		
-		
-		
-		
9 V DC ... 30 V DC		
110 mA / 180 mA		
IP20		
-40 °C ... 70 °C		
Polyamide PA non-reinforced		
22.5 / 99 / 114.5 mm		
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12		
FCC Directive, Part 15.247 ISC Directive RSS 210		
Class I, Div. 2, Groups A, B, C, D		

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ISM-900-DATA-BD-BUS	**2867296**	1
RAD-ISM-900-DATA-BD-BUS-AU	**2867996**	1
RAD-ISM-900-DATA-BD-BUS-NZ	**2885168**	1

Technical data

Bi-directional	
902 MHz ... 928 MHz	
1 W	
4 x 63	
RS-232	RS-485/RS-422
9-pos. D-SUB (socket)	COMBICON plug-in screw terminal block
1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps	1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps
Asynchronous	
RTS/CTS	
8	
0 V ... 5 V	
10 kΩ	
8	
≥ 2.6 V DC	
≤ 2.4 V DC	
≥ 2.6 V DC	
≤ 2.4 V DC	
5 ms (minimum)	
Digital outputs	
40 V DC	
500 mA (sinking)	
12 V DC ... 30 V DC	
- / 4.1 A	
IP20	
-40 °C ... 70 °C	
Polyamide PA non-reinforced with aluminum heatsink	
64 / 99 / 114.5 mm	
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	
FCC Directive, Part 15.247	
-	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ISM-900-DATA-BD-PLUS	**2902277**	1

RAD-Line Ethernet with Trusted Wireless

The **RAD-ISM-900-EN-BD...** industrial wireless radio allows a wireless connection of several decentralized controllers to a central location (controller) via an Ethernet or serial connection.

- Operates in the license-free 902-928 MHz ISM band
- Frequency-hopping spread spectrum technology
- Provides an interface for transfer of data between 900 MHz wireless and Ethernet, RS-232, RS-422 or RS-485 interfaces
- Contains an adjustable 10 mW... 1 W transmitter
- Supports TCP/IP, UDP and IP v4 protocols
- Programmable for point-to-point, point-to-multipoint and multipoint-to-point configurations
- Incorporates security using selectable 128/192/256-bit AES encryption
- **RAD-ISM-900-EN-BD-BUS** features an integrated bus foot to connect I/O modules (addressable via Modbus)
- Individual modules can be configured as master, slave or repeater using integrated web browser interface
- **RAD-ISM-900-EN-BD/B** is a dedicated slave radio with no Ethernet ports

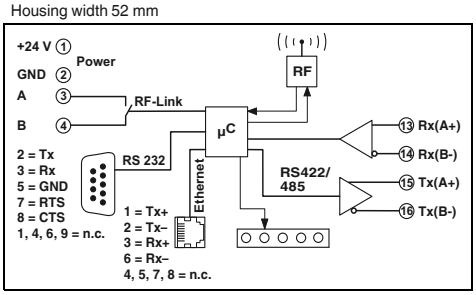
Notes:

The products are offered exclusively for export outside the European Economic Area (EEA).

Wireless transceiver for Ethernet and serial interfaces V.24 (RS-232, RS-422/RS-485)

Ex: cULus

Housing width 52 mm



Technical data

Wireless path		
Direction	Bi-directional	
Frequency range	902 MHz ... 928 MHz	
Transmission power	10 ... 30 dBm	
Serial port	RS-232	RS-485
Connection method	9-pos. D-SUB (socket)	COMBICON plug-in screw terminal block
Serial transmission speed	300 ... 57,6 kbps	
Data format/coding	Asynchronous	
Data flow control/protocols	RTS/CTS	
General data		
Supply voltage	11 V DC ... 30 V DC	
Current consumption	250 mA (at 24 V DC)	
Degree of protection	IP20	
Ambient temperature range	-40 °C ... 65 °C	
Housing material	Polyamide PA non-reinforced with aluminum heatsink	
Dimensions W / H / D	52 / 99 / 115 mm	
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance / approvals		
Conformance	FCC Directive, Part 15.247 ISC Directive RSS 210	
UL, USA / Canada	Class I, Div. 2, Groups A, B, C, D	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Wireless module with optional Ethernet and serial interfaces			
Bus foot for I/O extension modules	**RAD-ISM-900-EN-BD-BUS**	**2900017**	1
Cannot be extended	**RAD-ISM-900-EN-BD**	**2900016**	1
Wthout serial ports	**RAD-ISM-900-EN-BD/B**	**2901205**	1

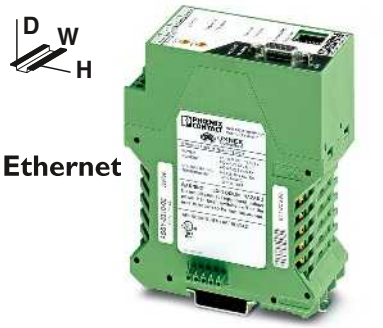
RAD-Line Ethernet with 400 mW WLAN

High-power Ethernet industrial wireless radio transceivers that conform to IEEE standard 802.11b/g.

- Operates in the license-free 2.4 GHz ISM band
- Features a 400 mW industrial radio transceiver
- Selectable 802.11i high security with 128/192/256-bit AES encryption and optional 802.1x authentication
- Supports TCP/IP, UDP, and IP v4 protocols
- Individual modules can be configured as point, bridge or client modes using integrated web browser interface
- Bridge mode allows for a network of up to 40 nodes on a single network resulting in a highly reliable network
- Provides an interface for transfer of data between legacy serial devices (RS-232, RS-422, RS-485 interfaces) onto an Ethernet network
- Programmable for point-to-point, point-to-multipoint and multipoint-to-point configurations
- Optional integrated bus foot for connection to RAD-Line extension modules
- Can be used as a Modbus RTU/TCP gateway

Notes:

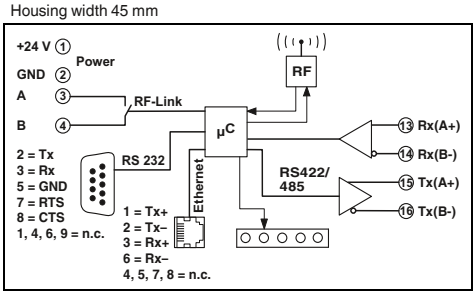
The products are offered exclusively for export outside the European Economic Area (EEA).



WLAN wireless transceiver for Ethernet and serial interfaces (RS-232, RS-422/RS-485), can be extended with I/O extension modules

Ex: cULus

Housing width 45 mm



Technical data

Wireless path			
Direction		Bi-directional	
Frequency range		2.4032 GHz ... 2.4799 GHz	
Transmission power		400 mW	
Serial port		RS-232	RS-485/RS-422
Connection method		9-pos. D-SUB (socket)	COMBICON plug-in screw terminal block
Serial transmission speed		300 ... 57,6 kbps	300 ... 57,6 kbps
Data format/coding		Asynchronous	
Data flow control/protocols		RTS/CTS	
General data			
Supply voltage		12 V DC ... 30 V DC	
Current consumption	typ. / max.	230 mA / 280 mA	
Degree of protection		IP20	
Ambient temperature range		-40 °C ... 60 °C	
Housing material		Polyamide PA non-reinforced	
Dimensions W / H / D		45 / 99 / 115 mm	
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance / approvals			
Conformance		FCC Directive, Part 15.247 ISC Directive RSS 210	
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D	

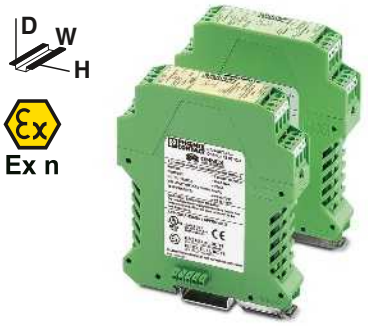
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
WLAN wireless module, high power transceiver with Ethernet and serial interface Bus foot for I/O extension modules	**RAD-80211-XD/HP-BUS**	**2900047**	1
Cannot be extended	**RAD-80211-XD/HP**	**2900046**	1

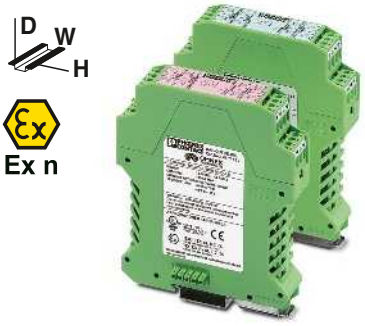
Extension modules

RAD-Line extension modules provide additional inputs and outputs for bi-directional RAD-Line IO and RAD-Line serial wireless systems.

– Easily installed via an integrated bus foot
– Bus provides power supply voltage
– Data transferred to transceiver module via bus
– Up to 8 modules can be connected to a single transceiver
– A maximum of 33 analog or 66 digital signals can be configured, depending on the selection of modules

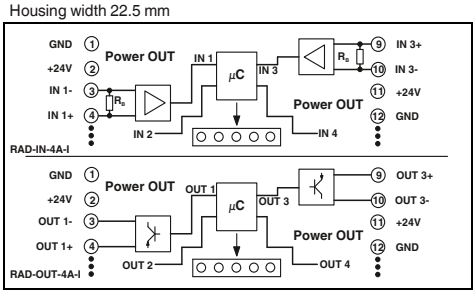


Analog components for 4 inputs or 4 outputs

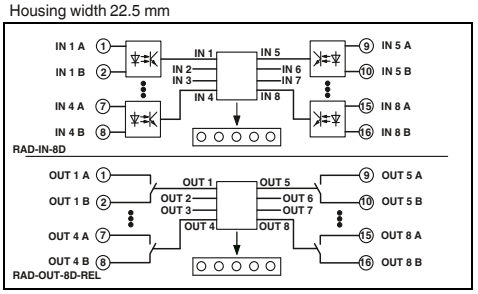


Digital components for 8 inputs or 8 outputs

Ex:
Housing width 22.5 mm



Ex:
Housing width 22.5 mm



Technical data

		RAD-IN-4A-I	RAD-OUT-4A-I
Analog input			
Number of inputs		4	-
Signal range		4 mA ... 20 mA	-
Input resistance		< 170 Ω	-
Digital input			
Number of inputs		-	-
Signal range		-	-
Switching level	1 signal (“H”)	-	-
	0 signal (“L”)	-	-
Input frequency			
Pulse length		-	-
Analog output			
Number of outputs		-	4
Signal range		-	-
Load R_B		-	700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)
Digital output			
Contact type		-	-
Switching voltage		-	-
Switching current		-	-
Clock frequency		-	-
Frequency output		-	-
General data			
Supply voltage		9 V DC ... 30 V DC (via bus foot)	9 V DC ... 30 V DC (via bus foot)
Current consumption	Typ./max.	100 mA / 130 mA	100 mA / 130 mA
Degree of protection		IP20	IP20
Ambient temperature range		-20 °C ... 65 °C	-20 °C ... 65 °C
Housing material		Polyamide PA non-reinforced	Polyamide PA non-reinforced
Dimensions W / H / D		22.5 / 99 / 114.5 mm	22.5 / 99 / 114.5 mm
Conformance / approvals			
Conformance		CE-compliant	
ATEX		II 3 G EEx nL IIC	
IECEx		Ex nL IIC	
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D	

Technical data

		RAD-IN-8D	RAD-OUT-8D-REL
Analog input			
Number of inputs		-	-
Signal range		-	-
Input resistance		-	-
Digital input			
Number of inputs		8	-
Signal range		5 V AC/DC ... 30 V AC/DC	-
Switching level	1 signal (“H”)	min. 5 V DC	-
	0 signal (“L”)	max. 1.5 V DC	-
Input frequency		max. 1 Hz	
Pulse length		-	-
Analog output			
Number of outputs		-	-
Signal range		-	-
Load R_B		-	-
Digital output			
Contact type		-	8 x relay output
Switching voltage		-	30 V AC/DC (EC Declaration of Conformity) 30 V DC (with UL approval) 250 V AC (with UL approval)
Switching current		-	0.5 A (EC Declaration of Conformity) 2 A (with UL approval)
Clock frequency		-	-
Frequency output		-	-
General data			
Supply voltage		9 V DC ... 30 V DC (via bus foot)	9 V DC ... 30 V DC (via bus foot)
Current consumption	Typ./max.	25 mA / 30 mA	100 mA / 160 mA
Degree of protection		IP20	IP20
Ambient temperature range		-20 °C ... 65 °C	-20 °C ... 65 °C
Housing material		Polyamide PA non-reinforced	Polyamide PA non-reinforced
Dimensions W / H / D			
Conformance / approvals			
Conformance		CE-compliant	
ATEX		II 3 G EEx nL IIC	
IECEx		Ex nL IIC	
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D	

Ordering data

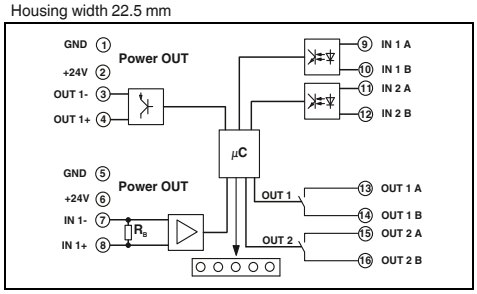
Description		Type	Order No.	Pcs. / Pkt.
Extension module	Analog IN	**RAD-IN-4A-I**	**2867115**	1
Extension module	Analog OUT	**RAD-OUT-4A-I**	**2867128**	1
Extension module	Digital IN			
Extension module	Digital OUT			
Extension module	Mixed I/O			

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-IN-8D	**2867144**	1
RAD-OUT-8D-REL	**2867157**	1

Analog/digital module for 2 digital inputs/outputs and 1 analog input/output

Ex: Ex, cULus, GOST
Housing width 22.5 mm

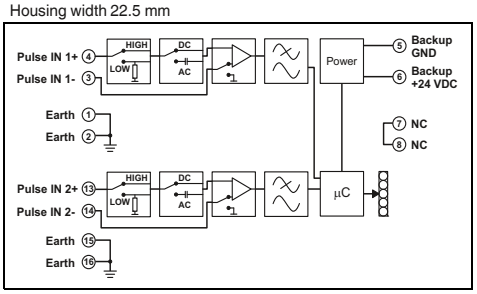


Technical data	
1	
4 mA ... 20 mA	
< 170 Ω	
2	
5 V AC/DC ... 30 V AC/DC	
min. 5 V DC	
max. 1.5 V DC	
-	
1	
4 mA ... 20 mA	
700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)	
2 x relay output	
30 V AC/DC (EC Declaration of Conformity)	
30 V DC (with UL approval)	
250 V AC (with UL approval)	
0.5 A (EC Declaration of Conformity)	
2 A (with UL approval)	
-	
-	
9 V DC ... 30 V DC (via bus foot)	
70 mA / 110 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
CE-compliant	
Ex II 3 G EEx nL IIC	
Ex nL IIC T5	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
RAD-IN+OUT-2D-1A-I	**2867322**	1

Digital module for two counter/frequency inputs

Ex: cULus
Housing width 22.5 mm

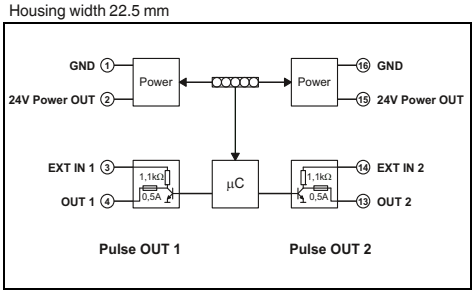


Technical data	
-	
-	
-	
2	
0.1 V AC/DC ... 30 V AC/DC	
(Common mode 3.6 V DC) / (differential mode 100 mV_{PP})	
-	
(0.1 Hz ... 10 kHz (50% Duty Cycle))	
(High time 50 µs)	
-	
-	
-	
-	
-	
-	
-	
9 V DC ... 30 V DC (via bus foot)	
35 mA / 45 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
CE-compliant	
Ex II 3 G EEx nL IIC	
-	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
RAD-IN-2D-CNT	**2885223**	1

Digital module for two counter/frequency outputs

Ex: cULus
Housing width 22.5 mm



Technical data	
-	
-	
-	
-	
-	
-	
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-	
Transistor output, passive	
-	
Approx. 27 mA (Terminal 3/14)	
Approx. 25 mA (Terminal 4/13)	
(High Speed 10 kHz with 50% Duty Cycle)	
(Low speed 10 Hz with 50% duty cycle)	
(0.1 Hz ... 10 kHz (50% Duty Cycle))	
9 V DC ... 30 V DC (via bus foot)	
90 mA / 115 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
CE-compliant	
Ex II 3 G EEx nL IIC	
-	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
RAD-OUT-2D-CNT	**2885236**	1

Accessories
Omnidirectional antennas

– Mobile or stationary applications
– Point-to-multipoint configurations
– Small antennas are suitable for applications with a shorter range
– Large antennas are suitable for applications requiring longer range

2.15 dBi gain

7 dBi gain

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 75 °C	-40 °C ... 80 °C
Degree of protection		IP65	IP65
Gain		2.15 dBi	7 dBi
Impedance		50 Ω	50 Ω
Connection method		MCX (male)	N (female)
Acceptance angle	vertical / horizontal	(N/A) / 360 °	17 ° / 100 °
Dimensions W / H		3 / 89 mm	3 / 609 mm
Frequency range		900 MHz	900 MHz
Scope of supply		Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
	RAD-ISM-900-ANT-OMNI-0-6	**2867160**	1	**RAD-ISM-900-ANT-OMNI-5**	**2867199**	1

Accessories
Omnidirectional antennas

– Mobile or stationary applications
– Point-to-multipoint configurations
– Small antennas are suitable for applications with a shorter range
– Large antennas are suitable for applications requiring longer range

5 dBi gain

8 dBi gain

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection		IP65	IP65
Gain		5.15 dBi	8 dBi
Impedance		50 Ω	50 Ω
Connection method		N (female)	N (female)
Acceptance angle	vertical / horizontal	28 ° / 360 °	15 ° / 360 °
Dimensions W / H		60.452 / 1123.95 mm	60.5 / 1803.4 mm
Frequency range		902 MHz	900 MHz
Scope of supply		Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
	RAD-ISM-900-ANT-OMNI-FG-3-N	**2867791**	1	**RAD-ISM-900-ANT-OMNI-FG-6-N**	**2885579**	1

Accessories
Directional (YAGI) antennas

– Stationary applications
– Point-to-point configurations for line of sight
– Longer ranges than omnidirectional antennas

5 dBi gain, with 0.6 m connecting cable

8.5 dBi gain, with 0.6 m connecting cable

Technical data		Technical data	
General data			
Ambient temperature range	-40 °C ... 80 °C	-40 °C ... 80 °C	
Degree of protection	IP65	IP65	
Gain	5 dBi	8.5 dBi	
Impedance	50 Ω	50 Ω	
Connection method	N (female) with cable (0.6 m)	N (female) with cable (0.6 m)	
Acceptance angle	vertical / horizontal 78 ° / 168 °	62 ° / 100 °	
Dimensions W / H	60 / 170 mm	60 / 170 mm	
Frequency range	900 MHz	900 MHz	
Scope of supply	Incl. mounting material	Incl. mounting material	

Ordering data				Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Directional antenna						
	RAD-ISM-900-ANT-YAGI-3-N	**2867801**	1	**RAD-ISM-900-ANT-YAGI-6.5-N**	**2867814**	1

Accessories
Surge protection

– For externally mounted installations
– Installed between antenna and radio for surge protection
– Replaceable, gas-filled arrestor

With N connector, grounded shield

Technical data		
General data		
Ambient temperature range		-40 °C ... 80 °C
Degree of protection		IP55
Attenuation	(at 900 MHz)	Typ. 0.2 dB (≤ 2.2 GHz)
Impedance		50 Ω

Ordering data			
Description	Type	Order No.	Pcs. / Pkt.
COAXTRAB, attachment plug with surge protection for coaxial cables			
N connector, plug-socket	**CN-UB-280DC-SB**	**2818148**	1
N connector socket/socket	**CN-UB-280DC-BB**	**2818850**	1

Antenna splitter

– Allows multiple radios in an enclosure to share an antenna

Technical data

General data		
Ambient temperature range		-40 °C ... 85 °C
Degree of protection		IP20
Attenuation per branch	(at 900 MHz)	3 dB
Impedance		50 Ω
Connection method		Type MCX (female)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna splitter			
	RAD-ISM-900-ANT-4	**2867050**	1

Accessories
Adapter cable

– Various cables for connection of different antennas

Technical data

General data		
Ambient temperature range		-40 °C ... 75 °C
Attenuation	(at 900 MHz)	0.89 dB/m
Impedance		50 Ω
Conformance / approvals		
UL, USA / Canada		-

Technical data

General data		
Ambient temperature range		-40 °C ... 85 °C
Attenuation	(at 900 MHz)	approx. 1.5 dB/m
Impedance		50 Ω
Conformance / approvals		
UL, USA / Canada		Class I, Div. 1, 2, Groups A, B, C, D Class II, Div. 1, 2, Groups F, G

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable			
1.2 m long, MCX (male) -> N (female)	**RAD-CON-MCX-N-SB**	**2867717**	1
1.2 m long, 90° MCX (male) -> N (female)	**RAD-CON-MCX90-N-SS**	**2885207**	1
1.2 m long, SMA (male) -> N (female)	**RAD-CON-SMA-N-SS**	**2867403**	1
30 cm long, MCX (male) -> MCX (male)	**RAD-CON-MCX-MCX-SS**	**2867607**	1
Antenna adapter cable for Ex-zone 1			
90 cm long, MCX (male) -> RPSMA (male)	**RAD-CON-MCX-RPSMA-EX**	**2885621**	1

Accessories
Adapter cable

– Various cables for connection of different antennas

Antenna adapter cable, N (male) -> RSMA (male)

Technical data

General data		
Ambient temperature range		-40 °C ... 85 °C
Attenuation	(at 900 MHz)	0.37 dB @ 915 MHz
Impedance		50 Ω

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable			
0.5 m long	**RAD-PIG-RSMA/N-0.5**	**2903263**	1
1 m long	**RAD-PIG-RSMA/N-1**	**2903264**	1
2 m long	**RAD-PIG-RSMA/N-2**	**2903265**	1
3 m long	**RAD-PIG-RSMA/N-3**	**2903266**	1

Extension cable

– Various cables to extend distance between the radio and antenna
– Distance should remain as short as possible for reduced attenuation

Technical data

General data	
Ambient temperature range	-40 °C ... 75 °C
Impedance	50 Ω

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna extension cable, N connection at both ends (male)			
3 m long, attenuation (at 900 MHz) 0.5 dB/m	**RAD-CAB-RG58-10**	**2867364**	1
6 m long, attenuation (at 900 MHz) 0.5 dB/m	**RAD-CAB-RG58-20**	**2867212**	1
7 m long, attenuation (at 900 MHz) 0.25 dB/m	**RAD-CAB-RG213-25**	**2867597**	1
12 m long, attenuation (at 900 MHz) 0.25 dB/m	**RAD-CAB-RG213-40**	**2867377**	1
15 m long, attenuation (at 900 MHz) 0.25 dB/m	**RAD-CAB-RG213-50**	**2867225**	1
18 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-LMR400-60**	**2867380**	1
24 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-LMR400-80**	**2867393**	1
30 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-LMR400-100**	**2867238**	1
45 m long, attenuation (at 900 MHz) 0.08 dB/m	**RAD-CAB-LMR600-150**	**2885184**	1
60 m long, attenuation (at 900 MHz) 0.06 dB/m	**RAD-CAB-LMR900-200**	**2885197**	1